IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication OCTOBER 19, 1961

Ed Nanno

★ Gasalloy's J. A. Bousher and J. V. Bell:

Gas Process Puts Open Coils Into "Stainless" Market p. 133

Management Toughens Labor Stand p. 103

New Steel Inventory Forecast p. 109

Digest of the Week p. 2-3

250,000 full turns, more than a lifetime of service, and the amount of wear on ratchet drive lugs, or tangs, is practically unnoticeable. Corners remained sharp and clean and the surface unmarred.

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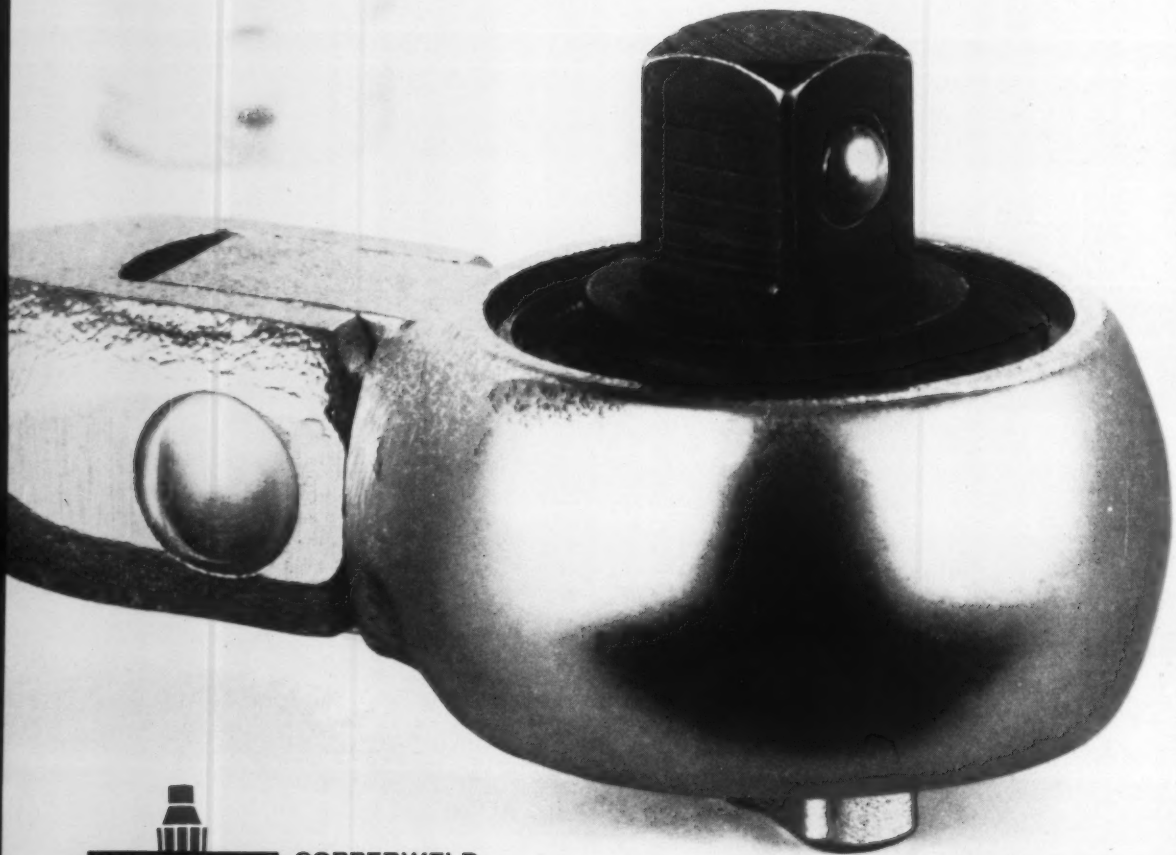

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KNOW YOUR ALLOY STEELS . . .

This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

How Alloy Steels Respond to Induction Hardening

In the induction-hardening process, steel is first heated above the transformation range by means of electrical induction, then quenched as required. Special equipment is needed, and heat is developed as follows:

High-frequency alternating current passes through a coil or inductor, with the result that a magnetic field is created in the coil. When the piece to be treated is placed in this field, it is heated rapidly by induced energy. With the various types of induction-heating equipment, the process is capable of surface- or case-hardening to various controlled depths; however, through-hardening can be obtained with certain alloy steels. Ferrous metals that respond well to induction hardening include numerous grades of both alloy and carbon steels, as well as hardenable stainless steel and plain or alloyed cast iron.

As a rule, when alloy steels which contain non-carbide-forming elements, such as nickel, are heated by induction, the usual hardening temperatures can be used. But with alloy steels that do contain carbide-forming elements such as chromium, molybdenum, and vanadium, the hardening temperature must be increased if the normal effect of the alloying elements is desired.

Hardness obtained by the induction process is a function of the carbon content and prior structure, just as it is when conventional heating methods are used. Nevertheless, higher surface-hardness values for a given carbon content have often been noted in parts subjected to surface induction-hardening. The extra hardness may be as much as five Rockwell C points for steels of 0.30 pct carbon.

As pointed out previously, the induction method requires special equipment. However, it possesses several marked advantages, including speed of heating and cleanliness of operation. Pieces heated by induction are usually subject to a minimum of scaling and distortion. Moreover, induction-hardening equipment is very compact and therefore conserves floor space.

If you would care to know more about the induction hardening of alloy steels, please communicate with our technical staff. Bethlehem metallurgists have made a thorough study of the subject, including the many details of quenching and tempering. Call them if they can help you in any way. And remember, too, that Bethlehem makes the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

This series of alloy steel advertisements is now available as a compact booklet, "Quick Facts about Alloy Steels." If you would like a free copy, please address your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

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IRON AGE

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Special This Week

Gas Diffuses Chrome Into Open Coils

Gas alloying puts open coils into the "stainless" market. J. A. Bauscher, vice president R&D, Lee Wilson Engineering Co., Inc., and J. V. Bell (right), R&D vice president at Alloy Surfaces Co., Inc., report on their companies' mutual efforts: Gaseous chrome forms a corrosion-resistant alloy on all coil surfaces. p. 133

Firm Labor Policies on Trial

General Electric case before NLRB points up potential clash on key labor points between management and government thinking. One major point at issue is management's right to communicate directly to workers on strike issues. p. 103

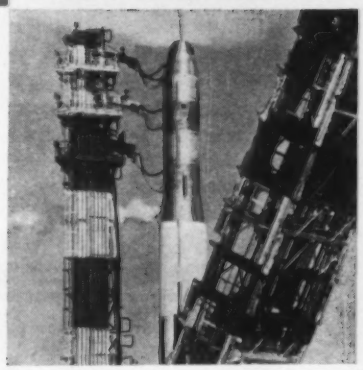
New Core Method Trims Engine Mass

Taking credit for Ford Motor Co.'s lightweight, cast iron engine is a new coremaking technique. The newcomer insures greater precision and uniformity in casting heads and engine-block walls. As a result, designers can specify thinner cast walls. p. 142

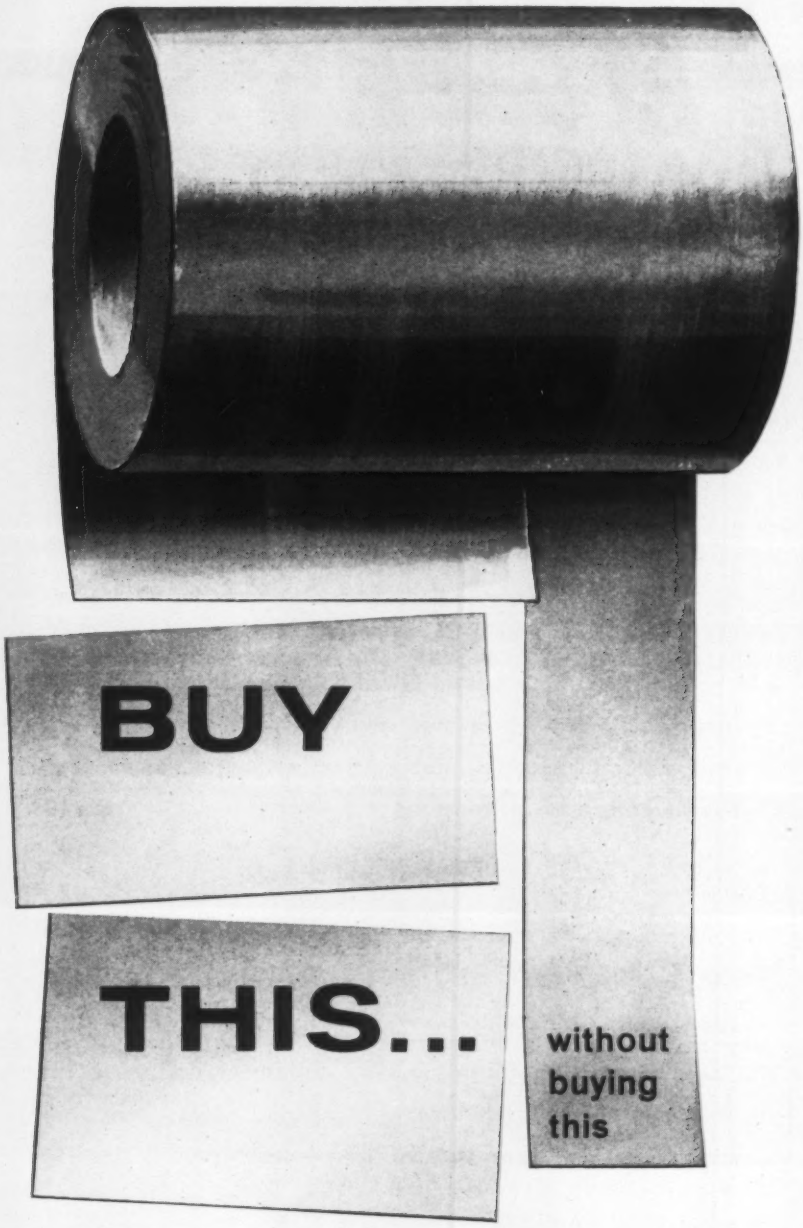
Next Week

Research: How to Make It Bear Fruit

Good management is just as important in research as in any other company activity. In the aerospace industry it's vital. But all too often business and research goals seem to be at odds. Next week's special report points up problems and solutions.



Aluminum buyers:



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At Ryerson you'll find the widest selection of aluminum alloys, tempers and gauges—plus expert technical help on selection and fabrication problems. This is just one more example of how Ryerson Metalogics gives you the most value for your purchasing dollar. So be "Metalogical"—call Ryerson.

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A Planned Economy Is Not a Free Economy!

Thousands of years ago, wise men tried to have a planned economy. All kinds of methods were used to control prices, production, and peoples' minds. None of them worked.

Not too many years ago—but long enough to be forgotten by some and not learned by others—we had "modern" efforts to control the economy. These attempts, too, failed. But worse than failure, they sowed the seeds of our own destruction.

Today, we have the same type of planners. The only difference is that many are younger. They either did not participate in, or did not analyze properly, events of the 1930's.

For some unknown reason, the Administration seems to be going along with the idea that the economy can be planned—and that these plans will work out as the wise ones say they will. They won't. History tells us that; so do common sense and bitter experience.

But apparently we are going to be subjected to what has failed in the past. The same ingredients are in the "overall" plan. First we have the use of "persuasion" by Senators and Congressmen. Then we have "inspired" press conferences with White House advisors.

Later, we have the President using his personal prestige and that of his office to get what his advisors think we, the people, should have. More subtly, we have the regrowth and reappearance of the theme that businessmen are immoral, that they place profits above the good of the nation, and that, generally speaking, they have to be watched like a hawk.

We do have laws in this land. There is due process of law. It is un-American to rule by improvision using international crises and the fear of harassment, plus age-old political dodges, as the means to kick people into line.

There is not now, and never has been, in government, individuals—singly or collectively—who are wise enough to know exactly what is good for us. There never will be—if we are to keep what we call democracy and individual freedom.

Government is all of us. No one is empowered to use it as his own way of getting all of us to do what a few want us to do.

The free enterprise system, subject to laws of the land and of the market place, is in tune with national growth, strength and maturity. It should always be given a chance to work. If it gets plowed under with plans galore, then we will have lost what we are supposed to be fighting for.

Tom Campbell

Editor-in-Chief

Take a Ledloy® steel—Inland's famous family of free machining steels—and give it all you've got! Go on—double and triple your normal speeds. Up to 325 sfm is common with Ledloy and believe us, far greater speeds are perfectly possible—up to 450 sfm with high speed tools —600 sfm with carbide tooling. ■ Step up the feed, too. Drill at 40 inches per minute at 750 rpm if you have the equipment for it. Matter of fact, you can't tell how much faster—better—you can do with a Ledloy steel 'til you've pushed it to the limit. ■ One thing to remember—you won't get these amazing results with just any leaded steel. To get the most out of your equipment, use Inland Ledloy—the original leaded steel. ■ That's right—Inland made leaded steels long before anyone else—has been developing the unique properties of Ledloy steels for more than 20 years—can recommend exactly the right type for your shop and your product. So use Ledloy steels—hit them with all you have...

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Recovery Train Is Slowed Down

A lot of people are backing off right now and taking a hard look at the economy. The recovery train seems to be slowed down. No red lights are flashing on the tracks, but some are flashing yellow.

Here is a picture of the mechanics of the current cycle: Steel and autos came to life about May. This advance pulled along the general economy. As other lines began to support steel and auto advances, early model changeovers and labor trouble in autos staggered the fledgling recovery.

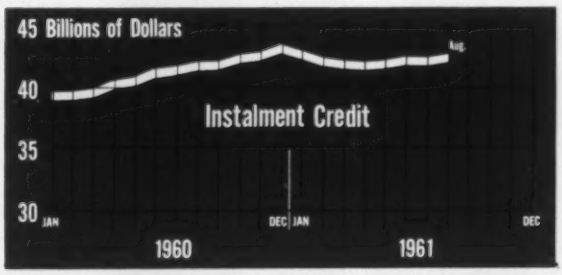
Add to this a record consumer purchasing power that refuses to break loose in the face of nagging unemployment and a war scare, and the picture comes into focus. A strong end product demand is needed to keep air in any business balloon.

The real test is here. Auto troubles are nearly over and employment is gaining. Unless the international crisis worsens, business should go on to hit new peaks.

Consumer Loan Men "Hopeful"

Although instalment credit moved up only $26 million in August to $42.6 billion, consumer loan executives are still optimistic. The up-and-down pattern of consumer credit this year—four months up, four months down—just doesn't reflect recovery forces.

Most of the loan experts gathered at a recent meeting said their business was showing "signs of moving up." And, important to makers of big ticket consumer products, the loan men say they are prepared to meet any sudden upsurge in borrowing.



Help for Defense Contractors?

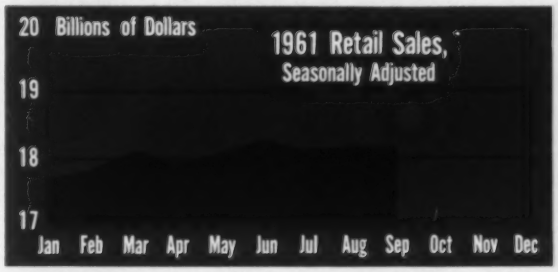
There may be help on the way for defense contractors who have long asked for improved "continuity" in government procurement. Bouncing from budget to budget by the government has wreaked havoc on many defense contractors. A project started in one year often has no appropriation the following year.

President Kennedy's insistence on long-term funds for foreign aid use is now considered by many as a first step in a policy to be extended to defense buying.

No Steam in Retail Sales

Like many indicators at the present, retail sales are pretty much rocking on dead center. In September, sales declined fractionally to $18.2 billion.

May is generally conceded to be the month marking the start of the recovery. But in May, retail sales were $18.0 billion.



Retail sales are not likely to come to life until late October or November when new auto sales pick up.

Inventory Buildup Not Likely

No big inventory buildup by U. S. industry is likely in the near future. This is the forecast of economist Eliot Janeway. And he bases it on the consumption performance of nickel.

Mr. Janeway calls nickel consumption, in any pre-emergency period, "the most authoritative leading indicator of the rate of inventorying by U. S. industry."

He estimates fourth quarter average monthly consumption at 21 million lb. This is under the 23 million lb rate for January 1960, the "boom stock level."

Corporate Fund Sources Shift

More top corporate financial planners are insisting their companies come up with an indication of probable needs in near-future short-term loans.

Here's the signal they see: In the first quarter, U. S. corporations raised 80 pct of their expansion and working funds from internal sources. Second quarter data shows this figure dropped to 70 pct.

As business expands, companies need more money for stock buildups and higher employment costs. For the "extra" money to get the "extra" business companies must soon turn heavily to the short-term market. Stable interest rates here could vanish overnight.

General Electric Makes Eddy-current-coupling Drives

And they're dependable drives. The complete line includes water-cooled and air-cooled eddy-current couplings. We call them KINATROL* drives. Ratings are from 1 to 150 horsepower, operating from standard a-c power.

A General Electric KINATROL drive is not just another eddy-current coupling. For instance, in the water-cooled coupling, water control is packaged. You'll see much less external piping. Furthermore, the coupling is protected from flooding—and the air gaps are dry, preventing corrosion.

KINATROL couplings are compact, field proven and dependable. General Electric has had a good deal of experience in the engineering, manufacturing, and application of packaged adjustable-speed drives. And we know how important service is to a customer.

KINATROL —a good product, with the kind of service you can depend on. Please call your nearest General Electric Sales Office for further details.

*Trademark of General Electric Company

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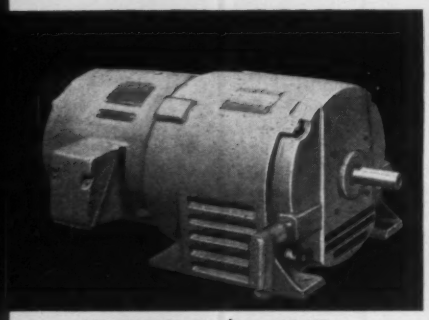
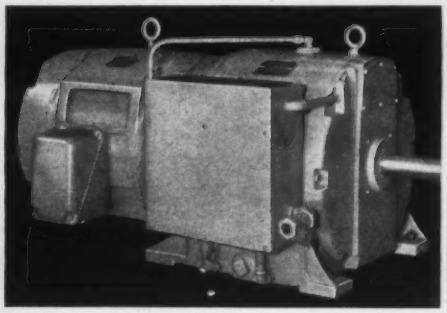
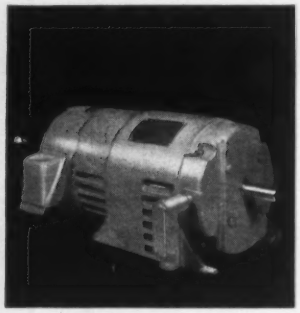


AIR COOLED, 7-1/2 to 100 HP



WATER COOLED, 25 to 150 HP



AIR COOLED, 1 to 5 HP

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USWA: Elections Challenged in Court

The former head of the "dues-rebel" faction of the United Steelworkers will ask a Federal court to set aside the election of David J. McDonald as president of the Steelworkers.

J. B. Ashton, attorney for Donald Rarick, said a suit will be filed on the grounds that USWA election procedures are illegal. In the election this year, Mr. Rarick failed in an attempt to be nominated when he could not win the support of enough locals.

The new move came after a Federal judge had voided the election of a USWA district director on the grounds of illegal election procedures. In this case, the "dues-rebel" faction was defeated in a vote for district director.

Federal Judge J. P. Wilson said the union constitution violated the Landrum-Griffin Act by not giving individual members enough say in the selection of international officers.

The union has been granted a stay order and is appealing. If upheld, the district ruling could affect other unions which use a general referendum for international elections. It would not directly affect the United Auto Workers and others which elect at conventions.

The Steelworkers express confidence the district ruling will be overturned. Attorney Ashton predicts a new election for president with court scrutiny barring irregularities.

UAW: How Much Do Ford Strikers Lose?

Based on current earnings, Ford Motor Co. hourly employes lose more than $2.6 million in wages every day a strike continues.

Total wage loss to the company's 117,000 UAW employes during a one-week strike is $13 million. A strike lasting one month would cost Ford hourly workers $54.6 million in wages, and one lasting six months would cost them $327.6 million.

In 22 previous authorized strikes against Ford, UAW members lost nearly $50 million in wages, not including a current strike at the St. Louis assembly plant which started July 26, 1961.

Most serious Ford Motor Co. stoppage was in May, 1949, when 98,312 hourly employes were idled.

Teamsters: Is Hoffa Hurt?

Are events finally swinging against the Teamsters' James R. Hoffa?

The controversial union leader has been in trouble before, and always managed to get out of it. But last week, he found himself in new difficulties.

First, the AFL-CIO invited disgruntled Teamster locals to pull out and join the AFL-CIO. Technically, it would be "rejoin," since the Teamsters Union was expelled from the AFL-CIO in 1957.

What hurt more was a statement by AFL-CIO president George Meany that he had received applications from more than 100 locals for charters.

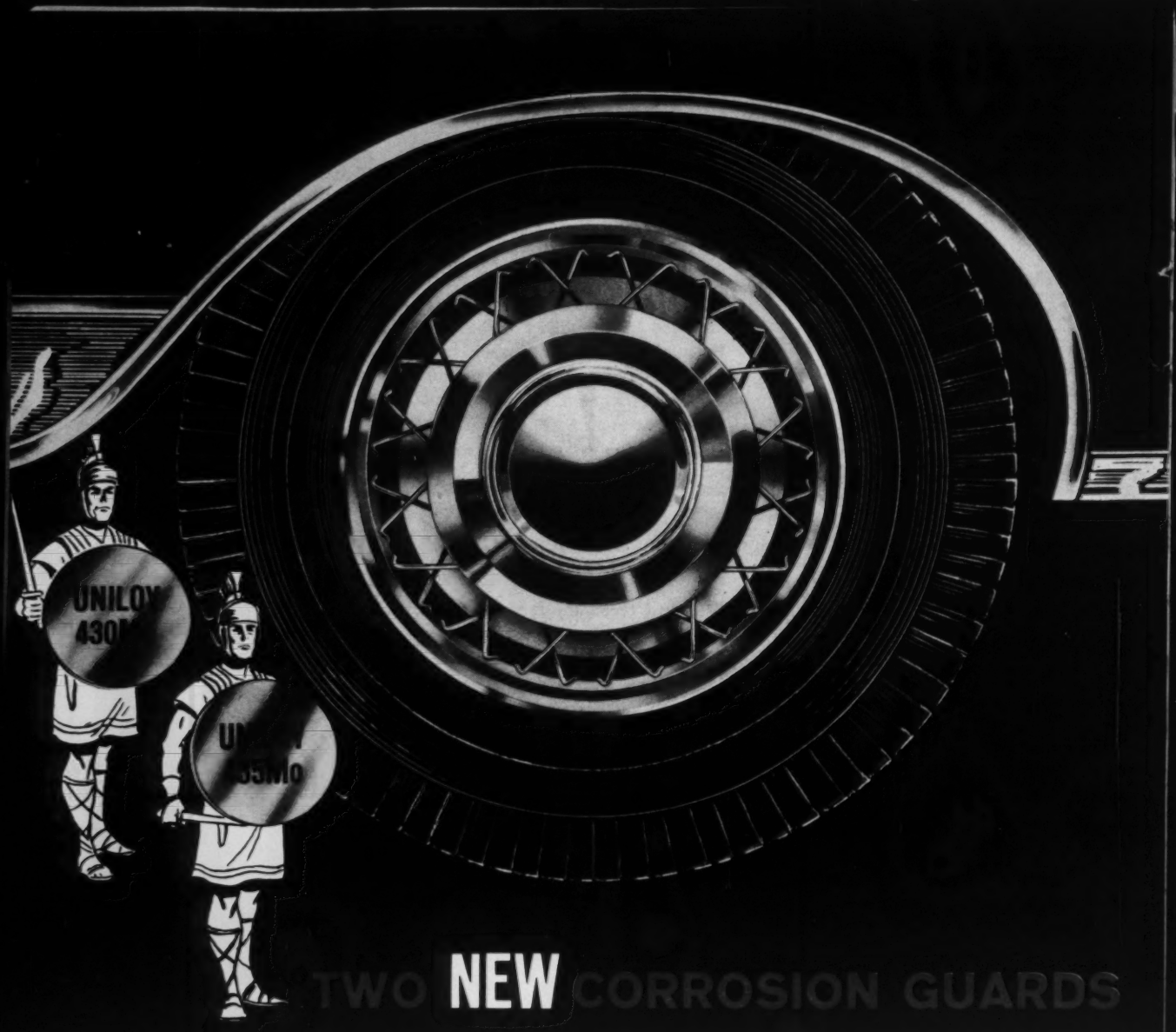
The embattled Mr. Hoffa struck back, indicating that, for once, he may have been struck in a sensitive spot. He immediately threatened to file suit this week against Mr. Meany for $1 million on charges of libel and slander.

"At that time," Mr. Hoffa said, "Meany will get an opportunity to bring forth witnesses and evidence, if any, of racketeering in the Teamsters Union."

Mr. Meany, he added, "also will have the opportunity to prove his statement that 100 local unions are seeking application for charter in the AFL-CIO or whether he is aiding employers, thus weakening the bargaining strength of members of the Teamsters Union."

HOFFA: Say it in court.

Finishing out the week, Mr. Hoffa found himself also indicted by a Federal grand jury on the charge of using the mail to defraud. The indictment charged misuse of more than $500,000 in union funds on a Florida real estate promotion. **A previous indictment was thrown out of court last July — but on the grounds that the jury was improperly selected.**



UNILOY 430Mo and UNILOY 435Mo STAINLESS STEELS

1962 models of major automobile manufacturers will take to the road with exterior parts produced from two new molybdenum bearing straight chromium stainless steels developed by Universal-Cyclops for maximum corrosion resistance.

UNILOY 430Mo—designed for use where *roping is not a factor.*

UNILOY 435Mo—designed for use where *roping is a factor.*

Exhaustive testing by Universal-Cyclops during the development of these alloys—confirmed by laboratory and production testing by automobile manufacturers—has proven that these two new stainless steels not only provide extremely high corrosion resistance, but also, outstanding fabricating and finishing qualities.

These new stainless steels are available with Universal-Cyclops' UNIBRITE finish—buffed beauty both sides. And, in production quantities in a full range of strip sizes. Uniloy 430Mo is also available in wire.

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STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE AND REFRACTORY METALS

★ Is Aluminum Probe Coming?

The aluminum industry may be in for the biggest antitrust investigation to hit the metalworking field since the steel industry was put on the "administered price" griddle.

Administered prices are part of this probe, too and the ogre of price-fixing charges has reared its ugly head.

The investigator is once again Sen. Estes Kefauver, (D., Tenn.), and his antitrust and monopoly subcommittee. The Tennessee senator is quickening his antitrust pace in many different areas.

He has just finished hearings on legislation to give the Justice Dept. power to demand records from businessmen for use in civil antitrust cases. This and other antitrust bills —particularly to put the blame for company antitrust violations on top executives—will be presented in a package to Congress in January.

The aluminum industry investigation is veiled in rumor and silence. First reports were that the Kefauver subcommittee had subsubpoenaed corporate records from about 20 aluminum makers.

These reports indicated that the primary aluminum producers were not involved. An inadvertent leak from the subcommittee revealed that complaints from unspecified sources had started the investigation.

Senator Kefauver's assistants immediately gave the subject the silent treatment. And the rumors began to fly. Views from various government sources point to these conclusions:

Sen. Kefauver's committee has begun an investigation, though it may be no more than what one source called "a fishing expedition to see if a full-scale investigation is warranted."

That less than a half-dozen, if any, subpoenas have been received by aluminum companies.

That primary interest now is in small fabricators and extruders, but that if there is a full-scale investigation and hearings, the primary producers won't be left out.

Sales and pricing procedures of independent fabricators and producer-owned fabricators, and the relationship of the two aluminum products makers, is what most concerns Sen. Kefauver.

■ Budget Decisions Affect Metalworking

Metalworking will be affected by upcoming budget decisions of President Kennedy. Though the ups and downs of balanced budgets appear to be only matters of high finance, they can be felt right down to the smallest sheet metal shop.

The President says he seeks a balanced budget next year. But he realizes if defense spending continues on the rise it will be almost an impossible task. The Defense Dept. is planning for a $2 billion hike in military spending next year.

On the plus side, more defense appropriations mean more sales for industry in military hardware and other defense supply items.

But on the minus side, a $2 billion increase in the military budget could be costly to industry. It would mean efforts to balance the budget would come in two forms — increased taxes and cuts in non-military spending.

Businessmen certainly would be among those hit with higher taxes. And cuts in non-defense spending by the government would end sales of many items to other government buyers and cut back many federal programs from which industry now benefits.

■ Identical Bids Eyed

The Justice Dept. will begin collecting identical bid information from states and cities on Nov. 1. New antitrust investigations of price-fixing will be based on this data from local governments.

The Justice Dept. is already collecting identical bid information from all government agencies.

Some 2000 government units ranging from state agencies to school districts will report identical contract bids on items costing more than $1000. The reports will be published as a deterrent to collusive bidding.

If investigation of these bids shows price-rigging by companies, the Justice Dept. will prosecute.

■ Court Will Rule On Price Competition

The U. S. Supreme Court will rule whether or not the Justice Dept. can enforce a ban on "unreasonably low prices." The Robinson-Patman act contains the ban.

The high court will decide if the act's language—"unreasonably low prices"—is too vague to be meaningful. Private industry interests claim the language is not meaningful and, therefore, not enforceable.

The Justice Dept. claims the restriction is necessary to stop one company from running a competitor out of business by below-cost sales. Justice Dept. officials also are battling to keep the restriction so they can use it in price-fixing cases.

PQA

proves it...

breaking point tests show Allen screws are consistently better

***PRODUCT QUALITY ASSURANCE**

PQA is the symbol of unquestioned quality at Allen. It stands for constant quality control from rigid upgrading of incoming raw materials to final, *unconditionally guaranteed* shipment to you.

To give you some idea: Federal Spec. FF-S-86a calls for 4,950 lbs. for the ¼-20 cap screw. Day-in, day-out breaking point tests of these screws prove that Allens are *consistently* better . . . well above the minimum requirement!

Quality checks like this one confirm PQA every step of the way through Allen's manufacturing process. And to help you keep costs down and profit margins up, Allen manufactures 1457 standard sizes.

Remember . . . it costs you no more to have *genuine* Allens right from stock, and they are only a minor fraction of your assembly costs.

ALLEN

MANUFACTURING COMPANY

HARTFORD 1, CONNECTICUT, U.S.A.

Plant at Bloomfield, Connecticut • Warehouses in Chicago, Cleveland and Los Angeles

Genuine ALLEN products are available only through your ALLEN Distributor. He maintains complete stocks close by to help cut your freight costs, inventory, warehousing and handling. He offers fast, single-source service. He knows Allen products. And he makes Allen Engineering Service available to you any time. Call him!

ALLEN HEX-SOCKET SCREWS HEAD

UK Steelmen Shift To Coil Lines

British steel warehouses and appliance makers are beginning to show interest in processing wide coils into narrow strip and sheet.

The auto industry there has installed 10 Vickers-McKay coil handling lines during the past five years. Price differential in the U.K. between sheet and coils is about $5.50 a ton.

At present, West German steel prices show no advantage for coils. But it will probably come because the cost differential is there.

Vickers-Armstrongs (Engineers) Ltd., has been making McKay machinery for several years in Newcastle on Tyne. Here too, in a recently re-equipped plant, Vickers makes Clearing presses, a line it has had since 1946.

"I estimate," said E. P. Cunningham, Chicago-based executive vp of Clearing Div., in England recently, "that Vickers has built more than 1500 Clearing presses. We used to sell here from the U. S. before the war. We couldn't do it after the war; hence the Vickers tieup."

Last week, in Chicago, Clearing showed a six-press line with fully automatic handling for Japan's Nissan Motors (Datsun, Bluebird), part of a $5 million order (see p. 119). Despite low labor costs, said Nissan's plant manager "we have found automation necessary."

Total U. S. Exports Surpass 1960 Pace

U. S. exports dipped slightly in August. But the total for the first eight months of 1961 is ahead of last year's pace.

According to statistics just released by the Dept. of Commerce, August exports (excluding Defense Dept. shipments), totaled $1.652 billion. This was 3 pct less than the July total of $1.707 billion, but greater than the August 1960 total of $1.621 billion.

For the first eight months of 1961, U. S. exports totaled $13.26 billion. This tops the 1960 total for the same period of $12.878 billion.

On a seasonally adjusted basis, exports for the first eight months of this year were at an annual rate of $19.891 billion. This is 3 pct above the annual rate of $19.381 billion for the corresponding period of 1960.

Canadian Trend

Nonferrous metals are carving a greater share in Canada's export volume.

Bank of Montreal reports this shifting pattern in the past decade.

Nonferrous metals accounted for 15 pct of total Canadian export volume 10 years ago. This jumped to 23 pct in 1960. Aluminum, uranium, nickel, copper and by-products are among ten top commodities now, with exports of each topping $200 million and accounting for 4 to 5 pct of total volume.

Iron ore also is forging ahead. In 1951, iron ore exports totaled $19 million. With new Quebec-Labrador developments, this soared to $155 million last year, or 3 pct of total export volume.

World Business Report

Here are this week's key items of metalworking interest from many corners of the business world:

West Germany: Industry boom in West Germany has pushed per capita consumption of plastics near U. S. levels. Per capita use in U. S. is 30 lbs; West Germany, 24 lbs. Next in per capita order in the European market are: Belgium and Netherlands, 14 lbs each; France, 12 lbs; and Italy, 8 lbs.

Colombia: First modern high-speed canmaking factory is now operating at Barranquilla. Technical aid and machinery was provided by American Can Co. to owners, Envases Colombianos, S. A.

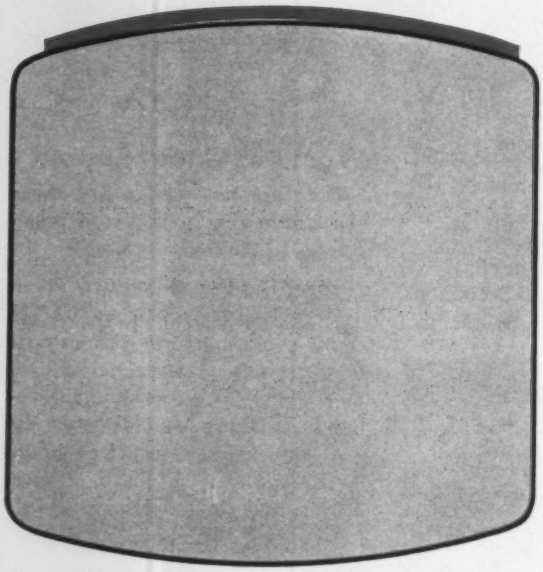
Italy: Planet Corp., Lansing, Mich., is supplying an automated foundry sand and flask handling system for the new Servettaz-Basevi foundry at Savona, Italy.

England: Over 70 members of the British Iron & Steel Institute landed in New York this week for a long-awaited tour. It was scheduled in 1938, cancelled when war threatened. British metalworkers will tour plants at Pittsburgh, Cleveland, Chicago, and Welland, Ont.

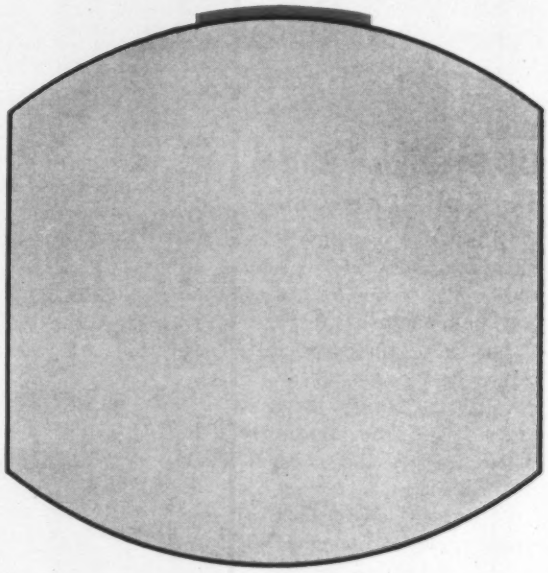
South Africa: Getman Brothers, South Haven, Mich., have shipped first ore carrier units to South Africa. Newly developed mining carriers are 15.5-in. long, 6.5-in. wide.

Brazil: Industrial production in first half, 1961, was 14 pct greater than same period in 1960, highest growth rate since World War II. Leading sectors were automotive, up 35 pct; electrical material, up 34 pct; and metallurgy, up 25 pct.

France: Compagnie des Machines Bull, Paris, placed $ multi-million order with Radio Corporation of America. Involved are 50 to 100 RCA data processing systems.



NEW: Now, SKF's improved "C" type design extends contact area over the entire length of a longer roller element.



OLD: In older flanged type bearings, effective contact area was no longer than the red line.

CAPACITY:

SKF®'s new "C" type bearing increases capacity as much as 54% by giving the roller some growing space.

The space was always there, but, until the SKF "C" type bearing, it was occupied by undercuts and fixed flanges. SKF removed them so the roller could be lengthened over a wider raceway.

Result: *The SKF "C" type bearing increases capacity up to 54%—corresponding to more than 4 times longer service life.*

SKF PUT THE GREATER LENGTH TO WORK. Length alone is not enough. It's only the raw potential for greater load-carrying capacity. A high capacity bearing has to be designed to *realize* that potential. Here's how the "C" type does it:

- CLOSE OSCULATION, that is close conformity between rings and rollers, distributes load evenly over the *entire* length of the roller.
- AN AXIALLY FLOATING FLANGE, combined with the symmetrical roller, assures automatic and *even* distribution of load under any combination of radial and thrust loads.

See for yourself! Ask your SKF man to show you his desk top demonstration of the new "C" type bearing. 6127

SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

Better Than X Rays?

A lot of interest is being shown in the use of neutrons for metal radiography. Although development is still in its early stages, neutrons would be used to penetrate metal in the manner of X rays. According to Argonne National Laboratory, the neutron technique would probably allow interior studies of large bodies of metal in much shorter times than are possible with X-ray testing.

Steelmaking Speed Record

Record-breaking speeds are reported for the basic-oxygen steel plant being broken in at Cleveland by the Jones & Laughlin Steel Corp. Vessels are already turning out 225 tons per hour. According to the company, this is four times faster than the best openhearth production runs.

Forges High-Temp Alloys

Construction of a precision hot-forging press with far-greater capacity than any to date may lead to a breakthrough in working high-temperature alloys, including columbium, tungsten and the die steels. Air-Force modernization funds are backing development of the press, which should knock out high-precision items, such as jet-blade airfoil sections, at a rate of 34 per minute. No finish machining will be required.

Gas Aids Explosive Forming

According to production experts, the use of gas mixtures in explosive forming improves efficiency. Since the gas becomes an optimum-shaped charge regardless of quantity, it boosts the forming rate. However, the gas mixture's greatest potential appears to lie in forming complex shapes and thin sections where its better control of high applied energy comes into play.

Reds Switch to Iron Rolls

Both bottom and middle steel rolls in a Russian three-high plate mill have been replaced by chilled cast iron rolls. The new rolls offer better wearing properties. As a result, the mill now uses half as many rolls in a given production run. The new bottom roll has a chilled surface 20-22 mm thick; for the middle roll, it's 15-20 mm. Alloy breakdown for the middle roll is 3.06 pct C, 0.32 pct Mn, 0.42 pct Si and 0.30 pct Ni. Corresponding percentages for the bottom roll are 3.07, 0.35, 0.46 and 0.25. Shore hardness equals 60.

Upgrades Tumbling Results

The Soviets claim that a new barrel-tumbling method improves polishing results on small steel parts. Electrolytic deplating is used to enhance the abrasive action. Tumbling takes place in an electrolyte. Adding copper shot produces a potential difference with the steel components.

Probes Corrosive Reactions

Some of the first experimental results from an important new method for studying surface reactions were described at a recent conference in Japan. Developed in the Bell Telephone Labs, this technique yields a detailed picture of the arrangement of atoms entering in such reactions. It may lead the way to a far more advanced understanding of catalysis and corrosion.

BELL SCIENTISTS: Study surface effects.

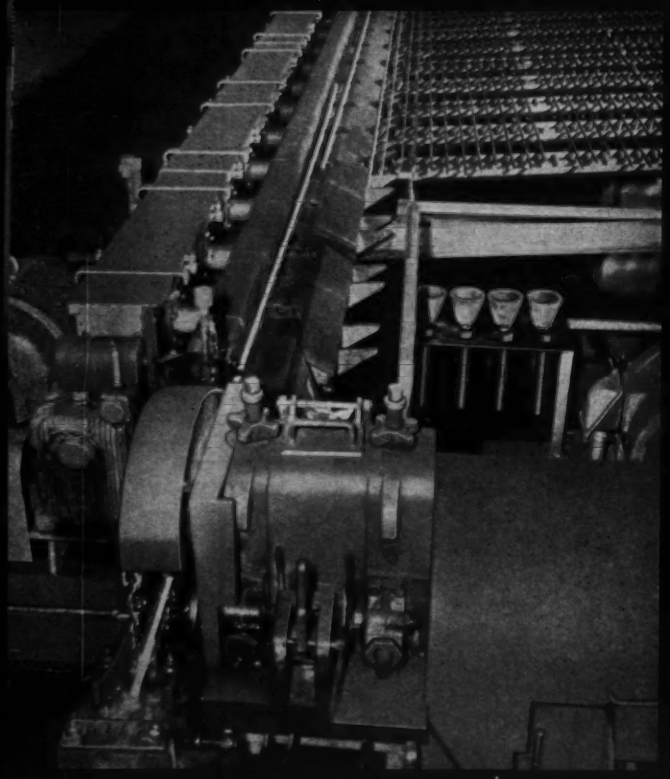
Cryogenic Aluminum Alloys

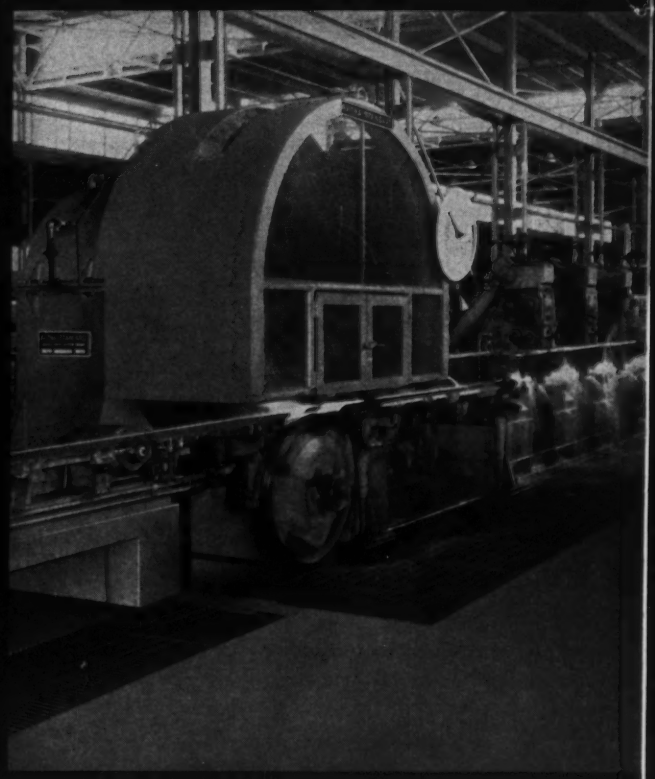
A recent report on experiments at Batelle notes: "In general, the data show that the tensile strengths of 5000-series, aluminum-magnesium alloys increase as the temperature is lowered to —423°F, in both the welded and non-welded conditions . . . They do not, for example, reveal a transition from ductile-to-brittle behavior as the test temperature is brought down."

2 REASONS... FOR

HIGH-SPEED PRODUCTION OF PIPE... (Small diameter)

by C. W. Mills, E. W. Mills, Seamless or Stretch Reducing





ROTARY KICKOUT

- Transfers pipe to Cooling Beds at high speeds.
- Simple mechanical design.
- No great gap required between pipe lengths.
- Pipes are staggered in Kickout and come to a complete rest in Kickout before being transferred onto the Cooling Bed.

ROTARY FLYING HOT SAW

- Cuts any desired length at close length tolerances.
- Length of cut can be changed at full mill speed.
- Runs continuously at high speeds.
- 24 Rotary Flying Saws in successful operation. Latest saw has been tested by actual running at speeds of 2000 F.P.M. and higher.

Aetna-Standard Division • 300 Sixth Avenue • Pittsburgh 22, Pennsylvania

OTHER FEATURES OF AETNA-STANDARD PIPE MILLS:

Stretch Reducing—Simple and rugged design allows fast changing of mill.

Cooling Beds—Screw type with Cooling Tanks. Automatic pipe handling for dividing of pipe and cropping if desired.

Uncoilers—Automatic handling of coils. No manual labor required.

Aetna-Standard Division

BLAW-KNOX

Friendless Business

In the Sept. 28 issue, editor-in-chief Tom Campbell discussed the anti-business atmosphere in Washington in an editorial, "Business Is Friendless: Make No Mistake About That." Below is reader comment on that editorial:

Sir—It is gratifying to know that at least certain portions of the press are conscious of what is happening to our free enterprise system with the growing menace of socialism continuing to advance . . . I hope you will continue to use your influence and your good magazine to keep preaching the gospel of the free enterprise system.—E. Jack Borisch, executive vice president, Milwaukee Gear Co., Milwaukee, Wis.

Sir—Your editorial is so factual and timely that I would like four copies to send to my senators and congressmen.—C. G. Hockett, chief production engineer, Fram Corp., Providence, R. I.

Sir—We would very much appreciate permission to reprint your fine editorial in the Erie, Pa., plant edition of the General Electric News.—Jack W. Schumacher, editor, General Electric Co., Erie, Pa.

Creative Selling

In the Sept. 21 issue we mentioned a survey which quoted a salesman's belief that "it's impossible to do creative selling when the buyer is signing letters and answering the telephone. Furthermore, he won't even let you in to see anyone in the shop." This brought the following comment from a reader:

Sir—Why does the salesman want to see someone in the shop? One reason may be that he can get a competitive advantage over other people selling similar products. If all salesmen are admitted to the shop, each loses this competitive advantage.

Furthermore, does the shop man have the time, and would it help him if he talked to all the salesmen who want to see him? Would it really help the salesmen?

I have been buying for only 32 years and consider myself still a student of marketing. But in my experience, the salesman who comes in with a new product will be put in touch with the department which can use it if the buyer feels it has any interest to them.

Sympathy is due the salesman whose call is interrupted by telephone calls. This deserves some consideration. However, most salesmen call without appointment, sometimes at inopportune times.

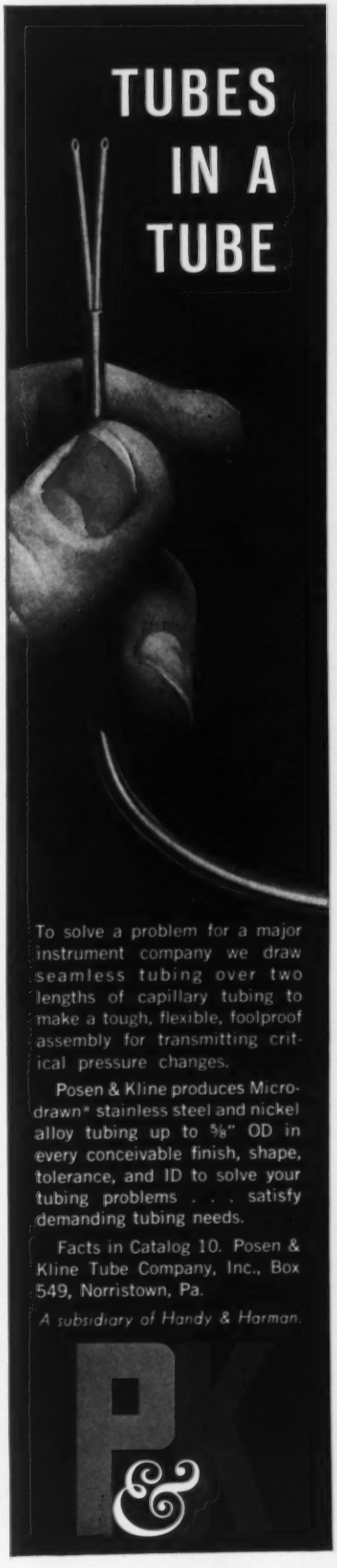
Forgive me for implying that I know anything about selling. If I did, I wouldn't be a buyer.—Name Withheld.

Important Omission

Sir—In your Sept. 28 article on "Forecasters Take a Look at 1962" you neglected to mention the predictions were made at the annual forecast meeting of the American Marketing Assn. in Cleveland.

This event has become an annual affair and is growing in importance every year. Others among the 53 local chapters of the American Marketing Association are also developing such forecast meetings in which marketing-minded managers might be interested.—F. J. Chokel, president, Cleveland chapter, American Marketing Association, Cleveland.

We regret the omission and agree the American Marketing Assn. did a fine job in bringing these people together and providing industry with the worthwhile forecasts.—Ed.


TUBES
IN A
TUBE
To solve a problem for a major instrument company we draw seamless tubing over two lengths of capillary tubing to make a tough, flexible, foolproof assembly for transmitting critical pressure changes.
Posen & Kline produces Microdrawn* stainless steel and nickel alloy tubing up to 5/8" OD in every conceivable finish, shape, tolerance, and ID to solve your tubing problems . . . satisfy demanding tubing needs.
Facts in Catalog 10. Posen & Kline Tube Company, Inc., Box 549, Norristown, Pa.
A subsidiary of Handy & Harman.
P&K

Now! Make any pushbutton station you want with new, completely versatile Cutler-Hammer oiltight pushbuttons

Choose from a complete line of operators, get greater circuit flexibility than with any other make

To meet today's need for a broad range of oiltight pushbuttons, Cutler-Hammer gives you a new versatile line.

You can get these rugged proved pushbuttons in one hole or base mounting, six bright colors. More than thirty different circuit arrangements are available plus hundreds of varieties of stations in standard arrangements of up to 25 elements. And you can get up to 8 circuits on one pushbutton. The flexible oil resistant diaphragm behind the button is designed to stay soft and pliable permanently.

With Cutler-Hammer pushbuttons you can get more control in less space, too, because they use 40% less behind the panel space than the next smallest unit.

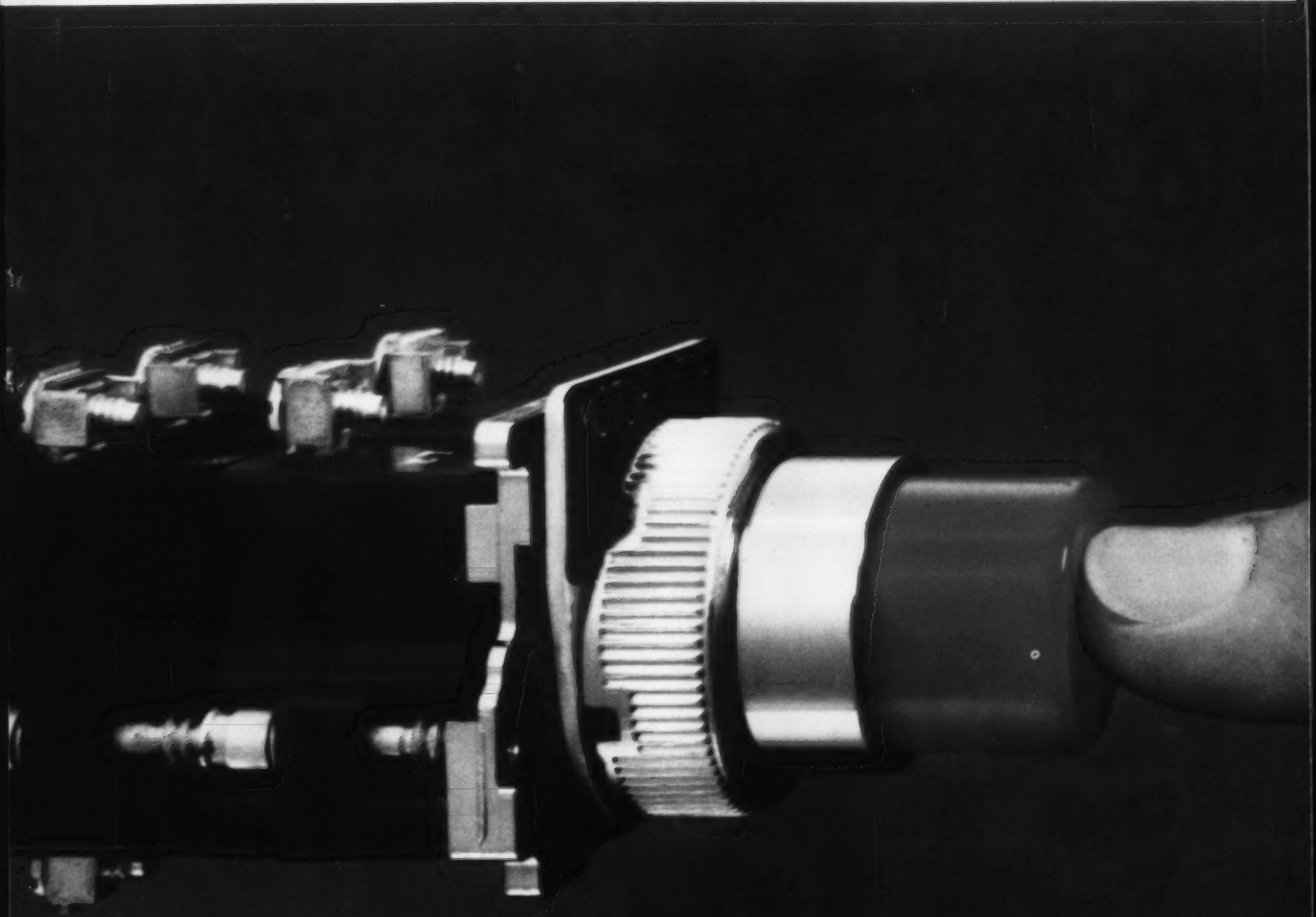
Get all the facts by sending for the colorful brochure, "MASTER DESIGN" which tells you all about the Cutler-Hammer line. Ask for Pub. LO-104.

What's new at Cutler-Hammer? You can see the newness in the products coming from Cutler-Hammer, like the new smaller pushbuttons; in the new manufacturing facilities; in the new engineering ideas. All to give you better service today and in the future. Contact the nearest Cutler-Hammer sales office or your Cutler-Hammer distributor.

WHAT'S NEW? ASK...

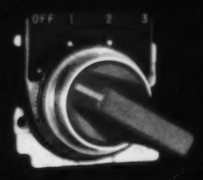
CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. • Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.



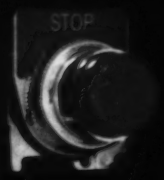
NEW ILLUMINATED PUSHBUTTON. Newest addition to the versatile line.

YOU CAN GET ALL THESE TYPES OF CONTROL UNITS



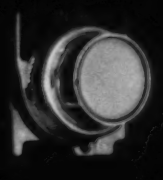
LEVER

MUSHROOM



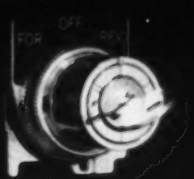
LONG

ROTO-PUSH



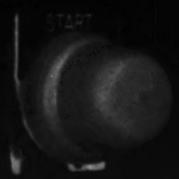
STANDARD

RESISTOR LIGHT



KEY

TRANSFORMER LIGHT



GUARDED

PRESTEST LIGHT

FATIGUE CRACKS

$10,000. in Awards for Hot Dip Galvanizing Ideas

Ten awards offered by American Hot Dip Galvanizers Association in cooperation with American Zinc Institute

Galvanizers International Award

THINK! Think about new uses for Hot Dip Galvanizing! Or, improvements in present uses! Or, new methods of after treatment! If your idea is accepted, you will receive one of ten awards of $1000 in cash, plus a handsome medal, plus an engrossed Certificate of Achievement.

Not a contest but a search for new ideas

This is not a contest—it is a search for new ideas. Your entry will not be judged against others, but solely on its merit and value in developing new applications and markets for Hot Dip Galvanizing. If your idea, in the opinion of the judges, is of practical value to the industry, you will be cited for an award—promptly.

The Hot Dip Galvanizing Industry is anxious to receive ideas of this type; therefore, the judges reserve the right to present *more than 10 awards,* if the entries warrant.

These well-known men will act as judges

Dr. Clarence H. Lorig, Technical Director, Battelle Memorial Institute and Past President American Society for Metals. Mr. John R. Daesen, Technical Director, American Hot Dip Galvanizers Association. Mr. John L. Kimberley, Executive Vice President, American Zinc Institute.

Anyone is eligible to enter

Anyone in the world (except members of the American Hot Dip Galvanizers Association and the American Zinc Institute, and their employees and advertising agencies) may submit one or more entries.

Business firms or corporations may submit entries under their business name, instead of as individuals, if they choose.

Entries will be considered by the judges promptly upon their receipt. No entry received after April 30, 1962 will be considered.

These are the kind of ideas we're looking for:

The Awards will be made for ideas pertaining to: (a) Applications of Hot Dip Galvanizing to a new or unusual field, or; (b) An improvement in application in fields where Hot Dip Galvanizing is now being used, or; (c) New methods of after-treatment of Hot Dip Galvanized products.

Each entry must contain:

(a) Description and documentation of application.

(b) Case history of the application or process accompanied by photo, drawings, formulae, etc.

(c) All technical data needed for the utilization of the idea submitted.

(d) Release of the application or idea for general use without payment or royalty other than the $1000 award.

Other conditions:

The decision of the judges will be final.

Award-winning ideas will be retained by the American Hot Dip Galvanizers Association for dissemination throughout industry. Other entries will be returned.

No formal entry blank is required. The entry should be accompanied by your name, address and business connection.

Entries should be sent to:

American Hot Dip Galvanizers Association, Inc.
5225 Manning Place, N. W.,
Washington 16, D. C.

Note: For information on galvanizing, write to the above address for name and location of the American Hot Dip Galvanizers Association member nearest you.

Abacus Set Back

Chinese progress is coming in more fields than steelmaking and nuclear power. Using Russian technical data, Red China has built its first high-speed electronic computer.

It's described as calculating from a range of 10^{-9}. Power consumption is 180 kw and it occupies a space of only 480 square meters.

Inside the unit are 4200 tubes, 40,000 resistors and capacitors and 4000 tiny transistors.

Behind the bamboo curtain, the computer is slated to solve bridge design problems. It will also speed transistor structural analyses.

But all this leaves unanswered the main question: What will happen to the displaced abacus operators? Will these skilled bead-pushers be able to find other employment?

Somehow China's great leap forward seems to be carrying it right into Atomic Age problems.

Illogical Computers?

While on the subject of computers, there's some disquieting news from the University of Michigan's Medical Center.

Psychologists giving tests to computers to find out how well the machines "think" may have come up with some shortcomings. Researchers John W. Gyr and Albert C. Cafagna of the UofM Mental Health Research Institute report, "The computer has a strong tendency to seek simple paths (to a solution) until more complex paths begin to have much in their favor. It discovers these other paths largely by accident."

"Also, it is relatively unable to retain information . . . and continuously diverts its attention to different but false paths and has a tendency to vacillate around a solution. Sometimes it gets close but on the next trial loses all or most of the ground gained."

Don't sell the computer short, however, the researchers note. "Other computer programs," they add, "basically more elegant theoretically, tend to lead to behavior which is less vulnerable to these shortcomings."

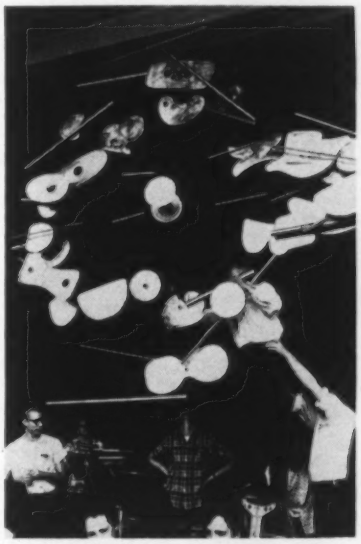
Sounds of Stainless

Stainless steel is now making its mark (or sound) in the musical world. A musical mobile, consisting of 56 pieces of stainless, has an important part in composer Toshiro Mayuzumi's new work, "Music With Sculpture."

For the performance, the 32 sheets and 24 tubes are suspended from lines of equal length above the orchestra (see photo). The score calls for tones from the stainless pieces. When the wind instruments are blown at the mobile, the pieces jingle together and create sound.

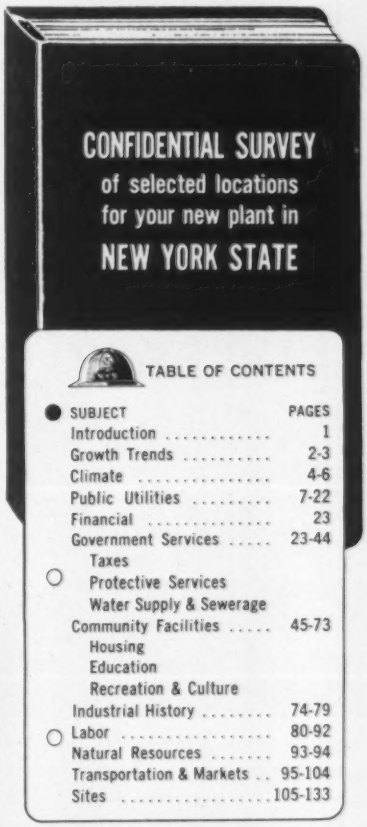
In addition, they offer visual appeal, supplying motion and light reflections.

Sculptor Yashuhide Kobashi designed the mobile from 22 gage, Type 304 sheets supplied by Stainless and Strip Div. of Jones & Laughlin Steel Corp.



SWINGING STAINLESS: Mobile supplies both sound and motion for musical composition.

FREE TO COMPANY OFFICIALS LOOKING FOR A NEW PLANT SITE



TAILOR-MADE REPORTS. The table of contents shown above is typical of the survey of selected plant locations that we will prepare for your organization. Simply send your specific requirements on your business letterhead to Commissioner Keith S. McHugh, New York State Department of Commerce, Room 4307, 112 State Street, Albany 7, N. Y.

Keith S McHugh

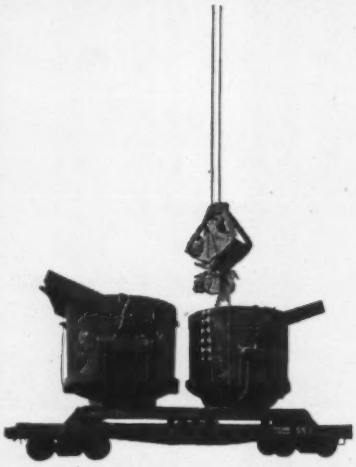
Keith S. McHugh, Commissioner
New York State Department of Commerce

We think this all-purpose weigh car is too good to keep to ourselves

This mark tells you a product is made of modern, dependable Steel.

Weigh anything up to 100 tons, anywhere on the track, with this new, all-purpose weigh car. It's accurate to within two-tenths of one percent of anything up to 100 tons or two separate 50-ton loads. Because the hydraulic load cells need no power, you can weigh anywhere. A weigh car can pay for itself by eliminating guesswork and human error.

At McLouth Steel Corporation in Detroit, Michigan, they cut handling time by weighing stainless steel scrap and other expensive alloying ingredients right in their stock yard. Accurate weight records give them better control of inventory and charging mixtures and make it easier to find the yield cost. Other steel producers cut costs by weighing to contro' electric furnace yields. We build this all-welded, stress-relieved steel car to stand up under all of these uses and give long, dependable service.



Loading scrap at McLouth Steel does double duty because the weighing is done at the same time. This cuts handling time in the mill and gives better control of the charging mixtures.

USS Weigh Cars and other industrial cars are built to last by United States Steel, a company that also uses them! We can custom design and build any type weigh car to suit your needs. Send your weight problems to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

United States Steel Corporation, Pittsburgh
Columbia-Geneva Steel, San Francisco
Tennessee Coal & Iron, Fairfield, Alabama
United States Steel Export Company

United States Steel

USS

TRADEMARK

COMING EXHIBITS

Fleet Maintenance Exposition—Oct. 23-26, New York Coliseum.

Metal Show — Oct. 23-27, Cobo Hall, Detroit. American Society for Metals.

Packaging Machinery Show—Nov. 7-10, Cobo Hall, Detroit. (Packaging Machinery Mfrs. Institute, 342 Madison Ave., New York 17.)

Marine Supplies & Equipment Show—Nov. 15-17, Hotel Roosevelt, New York City.

MEETINGS

OCTOBER

Magnesium Assn. — Annual convention, Oct. 22-24, Belmont Plaza, New York. Assn. headquarters, 122 E. 42nd St., New York.

National Assn. of Sheet Metal Distributors — Annual meeting, Oct. 22-25, Hotel Dennis, Atlantic City, N. J. Assn. headquarters, 1900 Arch St., Phila.

American Coke & Coal Chemical Institute — Annual meeting, Oct. 23-24, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 711 Fourteenth St., N. W., Washington, D. C.

Wire Assn. — Annual convention, Oct. 23-26, French-Lick Sheraton, French Lick, Ind. Assn. headquarters, 453 Main St., Stamford, Conn.

Society for Non-Destructive Testing—National convention, Oct. 23-27, Detroit. Society headquarters, 1109 Himman St., Evanston, Ill.

National Tool & Die Manufacturers Assn. — Annual convention, Oct. 24-28, Huntington-Sheraton Hotel, Pasadena, Calif. Assn. headquarters, 907 Public Square Bldg., Cleveland.

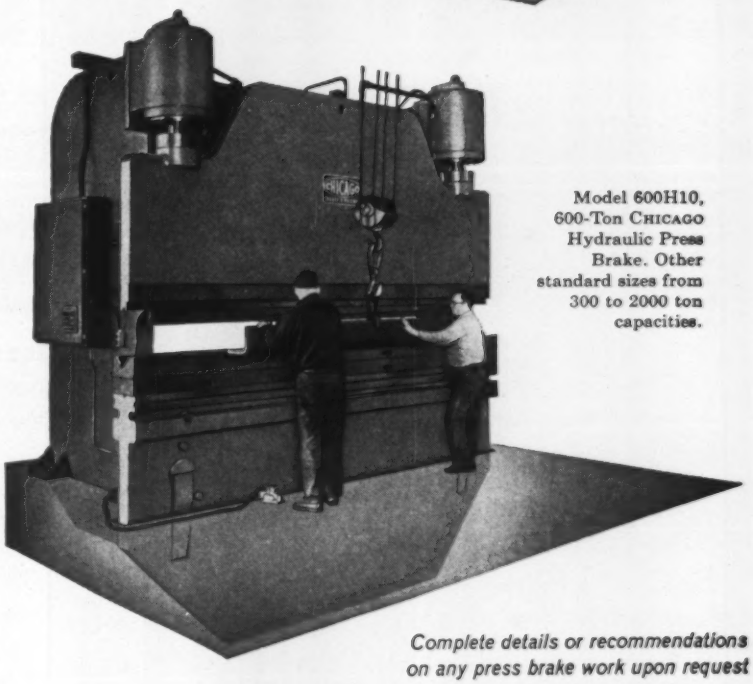
American Society of Tool Engineers — Semi-annual conference, Oct. 26-27, The Royal York Hotel, Toronto. Society headquarters, 10700 Puritan Ave., Detroit.

(Continued on P. 26)

CHICAGO® PRESS BRAKES

unexcelled accuracy / ***for sheet metal and plate work***

Model 410D, 90-Ton CHICAGO Mechanical Press Brake. Other standard sizes from 11 to 450 ton capacities.



Model 600H10, 600-Ton CHICAGO Hydraulic Press Brake. Other standard sizes from 300 to 2000 ton capacities.

Complete details or recommendations on any press brake work upon request

9439

Press Brakes
Press Brake Dies
Straight-Side-Type Presses
Hand and Power Bending Brakes
Special Forming Machines

CHICAGO DREIS & KRUMP

DREIS & KRUMP MANUFACTURING CO.
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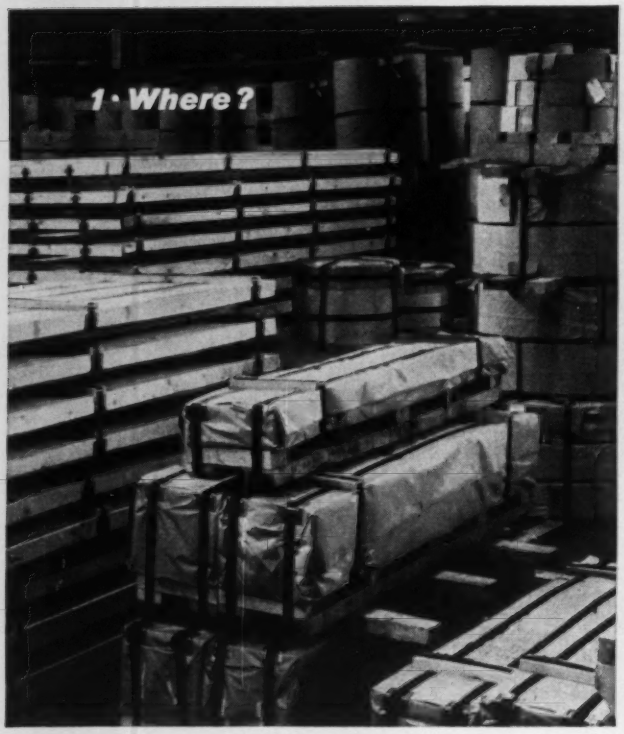
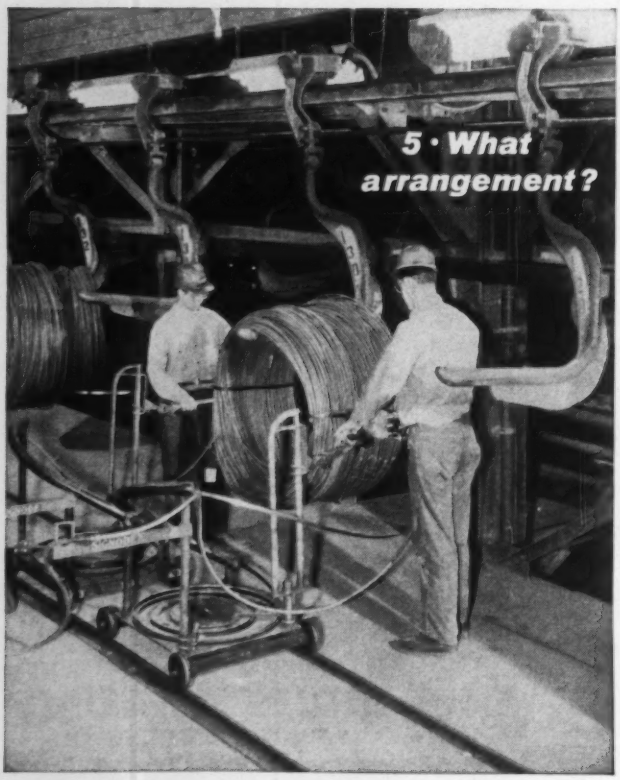


5 Basic Strapping Questions...



1. Where do you put the straps and how many should you use?

2. What kind and size of strapping is best for the application?

3. Should you use hand tools, power tools, or automatic strapping machines?

4. Would a simple jig or fixture help?

5. How should the work, the material flow, the tools, and the equipment be arranged?

Wrong answers are costly... right ones are free

If you have the right answers to these five questions, chances are that steel strapping is saving you money, making your products cost less to handle, ship, store, and receive.

But will those answers stay right? Your business does not stand still, any more than ours does. New products, new packages, new methods, new customer demands come along. Yesterday's right answers may be today's wrong ones.

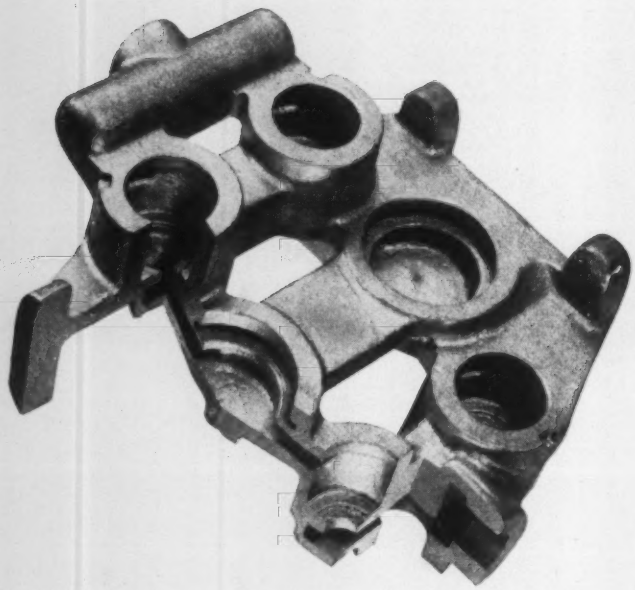
You need right answers *on a continuing basis*—and you get them free from Signode, with the help of—

- trained packaging and shipping specialists.
- the widest selection of hand and power strapping tools and automatic strapping machines.
- the most complete testing and engineering facilities.
- 48 years of experience in solving packaging, handling and shipping problems.

Why settle for less? For right answers, call the Signode man near you, or let us put him in touch with you.

First in steel strapping

SIGNODE
STEEL STRAPPING CO.
2623 N. Western Avenue, Chicago 47, Illinois
Offices Coast to Coast, Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto



CAUSTIC SOLUTION

A CASE IN POINT—This is a 19 pound Ni-Resist valve body designed to handle caustic fluids at 400 psi. It was cast for the John Bean Division of Food Machinery & Chemical Corp. Ni-Resist is ideal for this application because it combines high corrosion resistance with superior resistance to erosion from high velocity fluids.

The intricate coring required demands unusual skill to produce Ni-Resist castings leak-proof at 400 psi operating pressures. Hamilton Foundry succeeded in producing pressure tight castings, an accomplishment difficult for the best of foundrymen.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWinbrook 5-7491

MEETINGS

(Continued from p. 23)

Material Handling Institute, Inc.—Annual meeting, Oct. 29-31, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, No. 1 Gateway Center, Pittsburgh.

National Metal Trades Assn.—62nd convention, Oct. 29-Nov. 1, The Hotel Commodore, New York. Assn. headquarters, 222 West Adams St., Chicago.

NOVEMBER

Steel Founders' Society of America—Technical and operating conference, Nov. 13-15, Hotel Carter, Cleveland. Society headquarters, 606 Terminal Tower, Cleveland.

National Machine Tool Builders Assn.—Annual meeting, Nov. 14-16, Americana Hotel, Bal Harbour, Fla. Assn. headquarters, 2139 Wisconsin Ave., N. W., Washington, D. C.

National Foundry Assn.—63rd annual meeting, Nov. 15-17, Savoy-Hilton Hotel, New York. Assn. headquarters, 4321 St. Charles Rd., Bellwood, Ill.

American Society of Mechanical Engineers—Winter annual meeting, Nov. 26-Dec. 1, Statler-Hilton Hotel, New York. Society headquarters, 29 West 39th St., New York.

DECEMBER

American Institute of Chemical Engineers—54th annual meeting, Dec. 3-6, Hotel Commodore, New York. Institute headquarters, 25 W. 45th St., New York.

Spring Manufacturers Assn.—Annual meeting, Dec. 5-6, Biltmore Hotel, New York. Assn. headquarters, Box 1440, Bristol, Conn.

American Ordnance Assn.—43rd annual industrial preparedness meeting, Dec. 6, Waldorf-Astoria Hotel, New York. Assn. headquarters, Mills Bldg., Washington, D. C.

Metallurgical Society of AIME—10th Electric Furnace Conference, Dec. 6-8, Sheraton Hotel, Philadelphia. Society headquarters, 29 West 39th St., New York.

Koroseal linings installed by New England Lead Burning Company, San Leandro, Calif.

Aluminum soaks in an acid bubble bath

SUBMERGED in that tank are racks of aluminum parts being anodized. The solution is sulphuric acid—so corrosive it eats holes in steel.

For years, the only way of keeping the dangerous acid from leaking out was to line metal tanks with lead sheets. This cost a lot, yet wasn't altogether foolproof. Every so often, a "wild" electric current would punch a hole in the lead lining. The whole department waited while the repair crew plugged the leak.

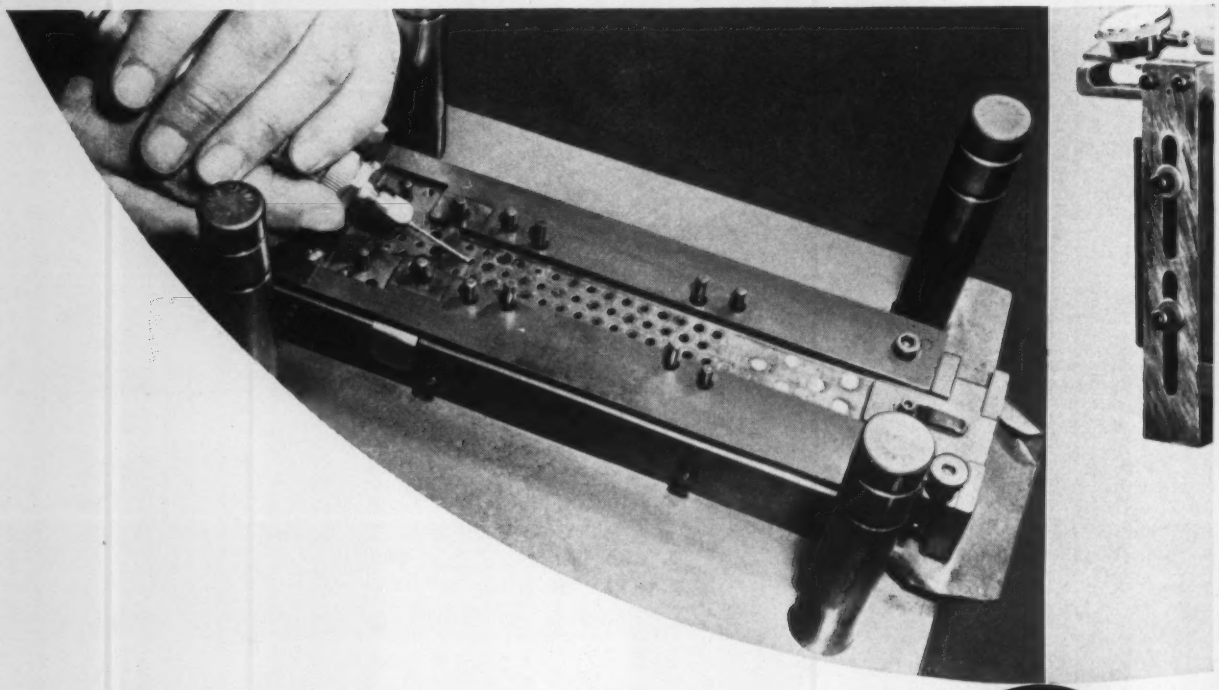
Then came Koroseal, the flexible material developed by B.F.Goodrich, that can stand practically all acids. When the aluminum fabricating company opened its new plant (shown above), the new sulphuric acid tank was lined with Koroseal. That was a year and a half ago. Since then, no leaks, no repairs, no delays in production.

Today, there are scores of installations in industry where Koroseal tank linings are handling acids and chemicals that ruin other materials—and doing it better and for less money than was ever possible before. If you have a tank lining problem, it's quite likely that we have the Koroseal or rubber lining that'll solve it. Try us. For information, write *B.F.Goodrich Industrial Products Co., Dept. M-176, Akron 18, Ohio.*

Koroseal—T.M. Reg. U.S. Pat. Off.

B.F.Goodrich

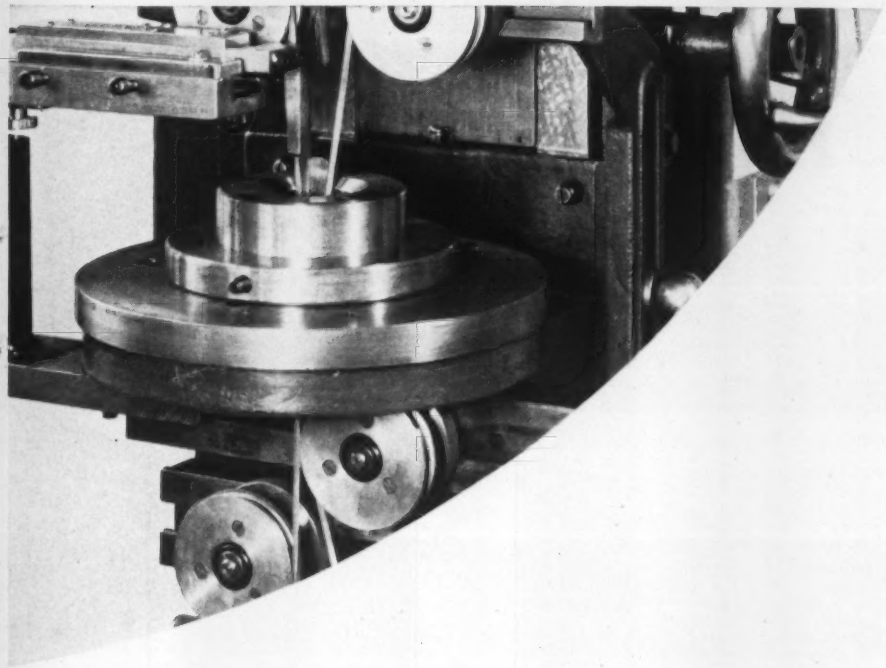
TANK LININGS



Grinding Ceramic Wafers *(below) for nuvistor tubes. Two diamond wheels finish 2000 wafers per hour for Electron Tube Division of RCA. Wheels remove 0.003" stock from each surface simultaneously. Previous method using abrasive belts ground only one surface at a time, resulting in nonuniform results and stoppages. Expected life of wheels: 5,000,000 wafers.* ▼

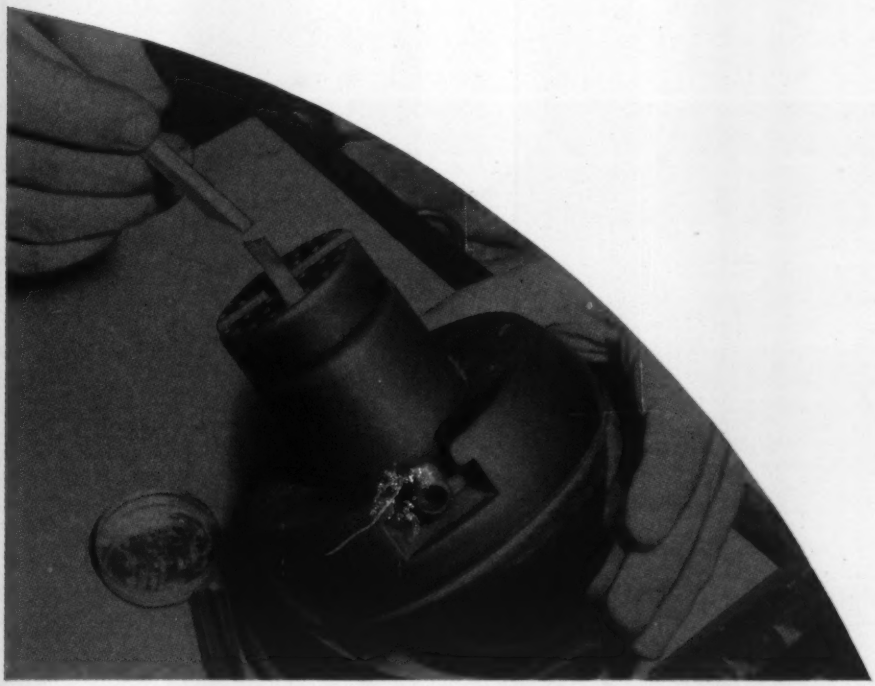
Servicing High-Speed Carbide Dies *(above). Jacoby Bender Inc. makes expansion watch bands. Their dies are for precious and semiprecious metals, as well as stainless steel. Finished products must have flawless finish. Small diamond quills from size .020" to ¼" diameter are used to build and service carbide dies. Grinders also cut decorative relief in some dies.* ▲

Industrial diamonds cut practically everything . . . especially your production costs



Polishing Drawing Dies *(above) for Chase Brass & Copper. Die-polishing job that once required 2 to 6 hours' handwork is now finished in 15 minutes with diamond belt polisher. Accuracies and surface finishes are also greatly improved. Belts are impregnated with 100, 200 or 300 mesh natural diamond grit. Up to 200 dies have been serviced by a single belt.*

Putting Mirror Finish *(below) on hardened steel part for a forming die at Jacoby Bender. The natural diamond micron powder is applied with a wooden lap. The diamond paste speeds up the polishing operation, and has less tendency to distort the true form of the tool-steel than methods previously used.*



Considering how well natural diamonds do these jobs may give you ideas

The four grinding and polishing jobs shown here span the fields of electronics, jewelry making, and metalworking. But they have one thing in common: in every case, natural industrial diamonds are doing the job quickly, economically and well.

In diamonds, you find this unique combination of properties: excellent cutting ability coupled with fantastic endurance.

Result: your diamond tools last longer than any other tools you can use. Your people spend more time producing, less time changing tools.

If you cut, sharpen or smooth in your business, you quite probably can use natural diamonds to advantage. Test them against the method you're now using. You will see how efficient — and economical—a diamond can be, especially now.

Best grit for metal-bond wheels developed by the Diamond Research Laboratory in Johannesburg

A new impact crushing method for natural diamonds is now producing the strongest and most durable diamond grit ever obtained for metal-bond wheels. Your tool and wheel manufacturer is ready to help you select the diamond tool that's right for *your* job.

Industrial Distributors (Sales), Ltd.

COLD FINISHED STEEL BARS ASSURE

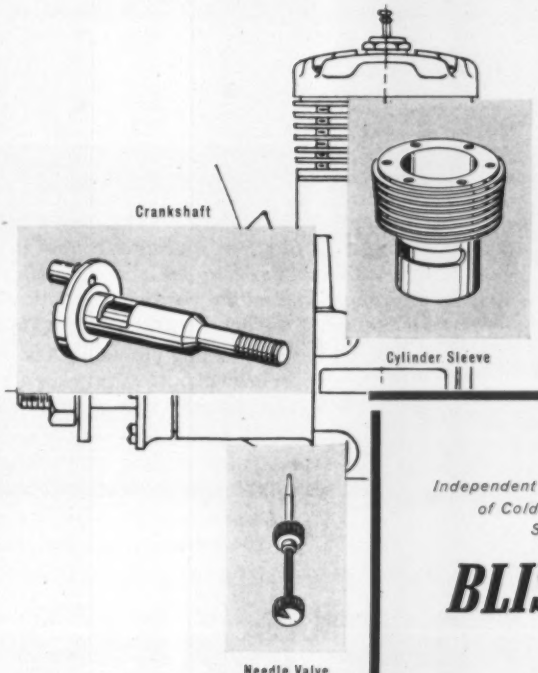
GRUELING MODEL FLYOFFS AT 125 mph

Only steel provides the stamina demanded for critical components of tiny model airplane engines. These midget powerhouses, weighing less than 8 ounces, are capable of speeds up to 125 mph during grueling flyoffs. Only cold finished steel bars can withstand that kind of field service.

For every 25,000 of these little engines, Bliss & Laughlin ships a carload of C-1213 and Ledloy A bars. Here is another example where Bliss & Laughlin furnishes precisely what is needed in strength and machinability. No more, no less. This means profitable production—whether for models or jets—because both the cost of materials *and* the cost of machining are considered.

Only cold finished steel bars are technically correct and economically sound for hundreds of thousands of applications. Check out your designs with Bliss & Laughlin. As the leading specialist in strength, finish, accuracy, straightness and machinability for 70 years, Bliss & Laughlin recommends the most suitable and economical bars from the industry's largest line of cold finished steels.

Seven mills across America, collaborating with Steel Service Centers everywhere, assure prompt, helpful, local service.



Bliss & Laughlin 1⅜" and ⅝" Ledloy A rounds are machined into complex cylinder sleeves and miniature needle valve bodies and knobs for the McCoy "35" Red Head Stunt Engine. Sleeves are black oxided for appearance and rust resistance. Tiny crankshafts are produced from 1⅛" C-1213 rounds, cyanide hardened for wear resistance and coated with molydisulphide for friction resistance.

BL-618

Leading Independent Producer of Cold Finished Steel Bars

BLISS & LAUGHLIN

GENERAL OFFICES: Harvey, Ill. MILLS: Harvey, Ill., Detroit, Cleveland, Buffalo, Mansfield, Mass., Los Angeles, Seattle

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DENISON HydrOILics

How **AUTOMATIC ELECTRIC** assembles critical phone parts on **DENISON** Multipress via high precision...

SPINNING

HIGH PRECISION SPINNING *required for final assembly of delicate telephone receiver parts is done within specified tolerance of .001" on this Series "R" Denison Multipress in new Clean Room at Automatic Electric, Northlake, Ill. Write for free Bulletin 324–new "R-S-T" Series Multipress.*

FINAL ASSEMBLY of the vital operating components in Automatic Electric's new type 810 telephone receiver calls for an ultra-clean assembly area . . . *plus precision presswork to tolerances of .001".*

This Denison hydraulic Multipress is one of three Series "R" 8-ton Multipresses installed by Automatic Electric to handle key assembly operations in their new Clean Room.

Equipped with a special spinning die, this Multipress spins the telephone receiver shell-terminal board assembly to a frame-retaining ring assembly . . . joins these fragile parts in an airtight seal against dirt and moisture. Smooth, precisely controlled hydraulic ram pressure—an inherent performance feature of *every* Multipress—permits a positive, hermetically sealed closure with no damage to the delicate receiver components.

Do you have a pressing problem? Ask your nearby Denison Production Specialist about a **M**ultipress **A**nalysis **P**rogram in your plant. He'll help you **MAP** new ways to cut time and costs... improve quality on your toughest production jobs.

DENISON ENGINEERING DIVISION
American Brake Shoe Co.
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PUMPS • MOTORS • CONTROLS

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Better products, *faster*, from your National Seal distributor:

This is no surprise package

When you open a box of National Oil Seals, you know exactly what to expect . . . a quality product. Micro-Torc® leather and Syntech rubber seals are results of the finest engineering, design and testing techniques. They protect bearings better and longer.

To keep machinery running smoothly, replace used seals with new National Oil Seals. Your bearing specialist will help you set up a service stock with the right seals to keep your standby inventory in balance. (National Oil Seals are phosphate coated to protect against rust and corrosion while in the crib or shelf.) Call him today.

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DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

NEW PRINCIPLE IN TORQUE CONTROL LOWERS ASSEMBLY COSTS

Rotor announces J-42T torque control air impact wrench with new hydraulic amplifier

- **NEW** unique hydraulic amplifier shuts off tool at desired torque. This exclusive device results in...
- **FASTER** rundown and impacting speed. Cuts job time.
- **MORE ACCURATE** torque control with uniform results. Quick, easy adjustment...tamperproof.
- **ASK FOR DEMONSTRATION** of the J-42T to see how this outstanding development can cut costs on your assembly line.

Write The Rotor Tool Company, 26300 Lakeland Blvd., Cleveland 32, Ohio.

Here's the RIGHT TOOL for YOUR job!

ROTOR TOOLS®

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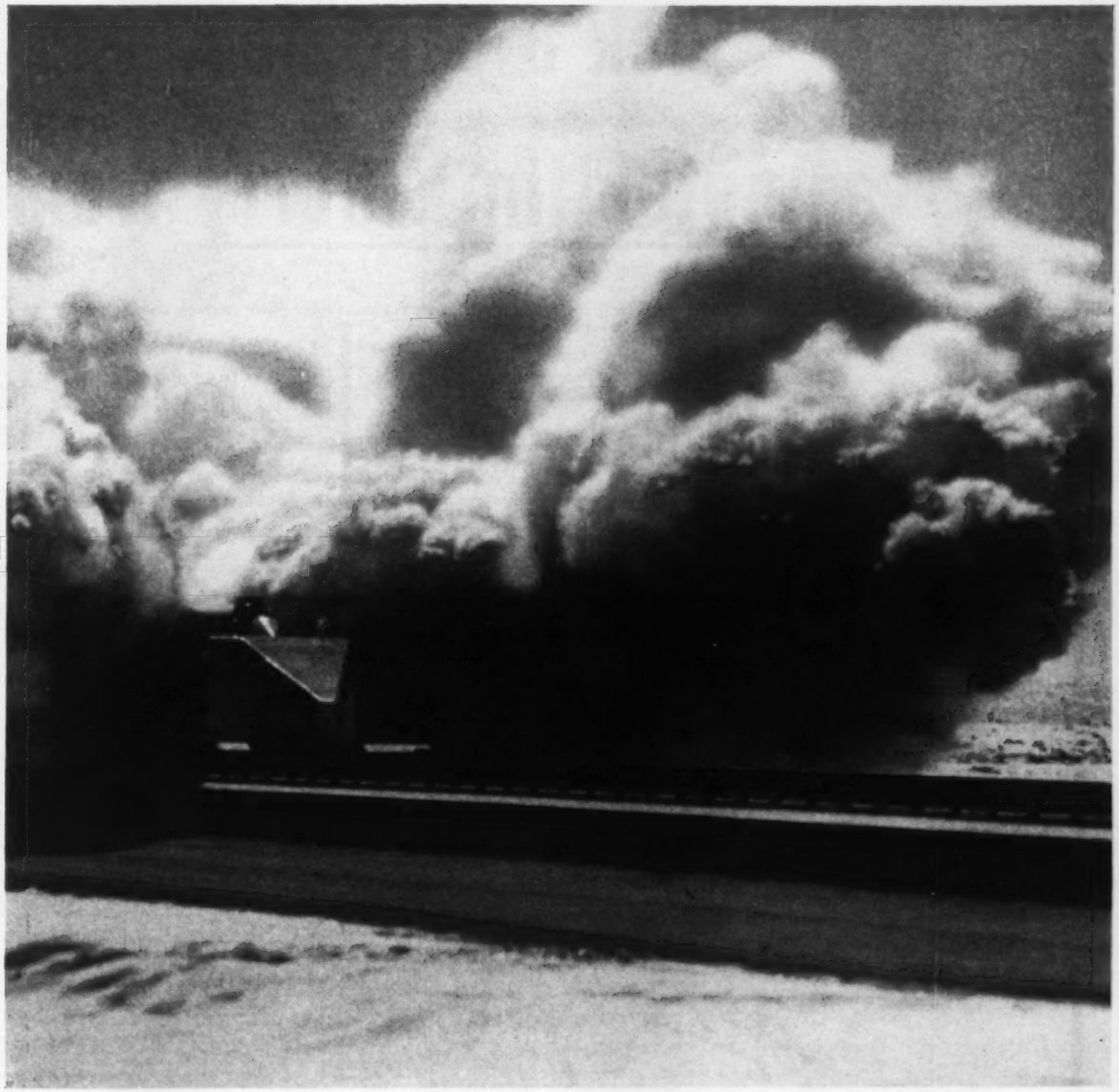
SUBSIDIARY OF THE COOPER-BESSEMER CORPORATION



DEPARTMENT OF DEFENSE—AIR FORCE PHOTO

HOW NICKEL TAKES THE MEASURE OF THE WORLD'S FASTEST ROCKET TRACK

This is a 2000-miles-an-hour-plus rocket sled hitting the water brakes . . . part of continuing tests by the Air Force Systems Command.

The sled travels on a 35,050-foot track that was built with such precision that even the curvature of the earth was considered in its construction.

Rocket, aircraft, and missile components roaring down this track at Holloman Air Force Base, New Mexico, are timed and photographed right at rail level. How? By blades—set at intervals of exactly 13.00 feet along the track—that interrupt a light beam as the sled rockets by.

To align these vital track blades, a tape made of Invar (36% Nickel) was specified. This nickel-iron alloy has an extremely low coefficient of linear expansion . . . virtually eliminates error caused by variations in ambient temperature conditions.

Consequently, there isn't .005-of-an-inch deviation in blade alignment in the *entire* seven miles of track.

When it's important to you that alloys resist all sorts of temperature conditions . . . or great stress and impact . . . or high corrosion . . . look to the alloys that contain Nickel. They might well solve your metals problems—accurately—and at practical cost. Why not write to us describing your metal needs.

THE INTERNATIONAL NICKEL COMPANY, INC.

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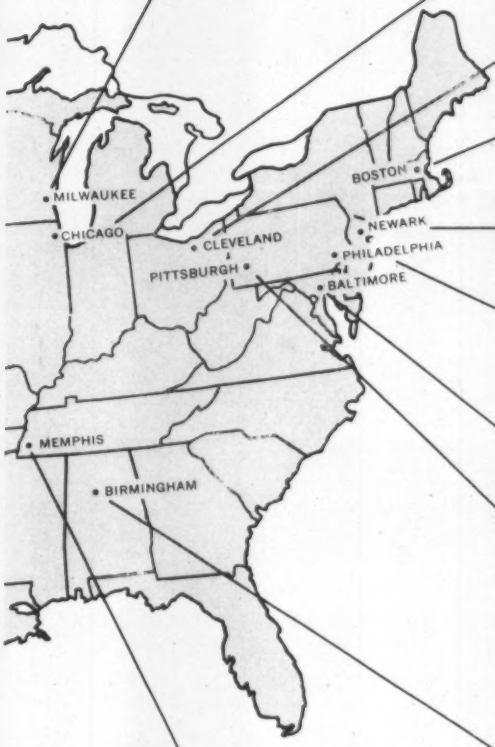

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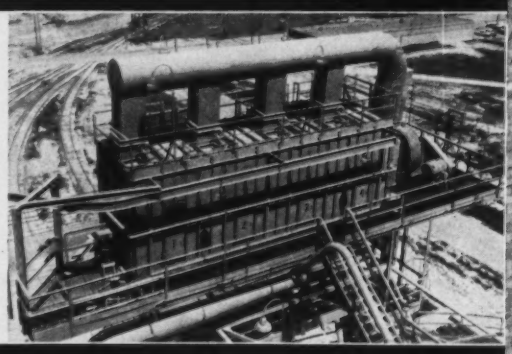
is your company's progress showing?

Not too many years ago, smoke clouds over a plant meant prosperity. Today, with the flood of public opinion against dirty air, such a sign has other connotations: (1) the plant is out-of-date; (2) the plant is probably inefficient and wasteful; (3) the owners are postponing their civic duties.

Nowadays, *clean* stacks are a sign of good management and an up-to-date plant. Many companies are keeping stacks clean by collecting dust and fume with a Dracco Dust Control system. Dracco installations use cloth filter bags—made from fiber glass, natural or synthetic fabrics—to provide high-efficiency collection of all visible particles. Each system is custom-engineered to a particular plant layout, and to the characteristics of the dust or fume to be collected. Nuisance dusts can be controlled and discarded . . . valuable dusts can be returned to process.

Take a look at your sky. If dirty air is one of your by-products, call a halt by calling Dracco Division of Fuller Company, Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

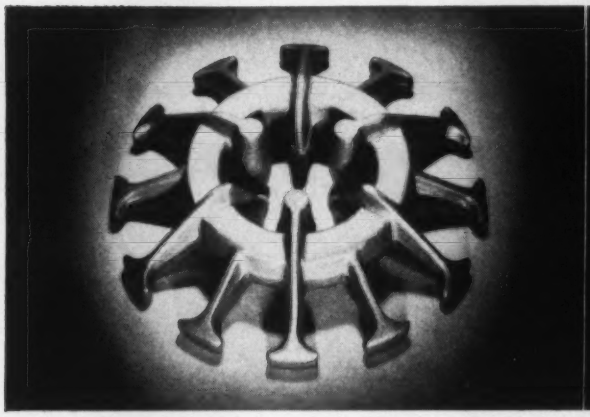


The use of glass cloth extends the application of Dracco bag-type filters to temperatures as high as 600°F., and sonic cleaning reduces maintenance costs. Higher temperatures are possible with auxiliary cooling. Dracco cloth filtration provides highest efficiency collection of dust particles even in the sub-micron range.

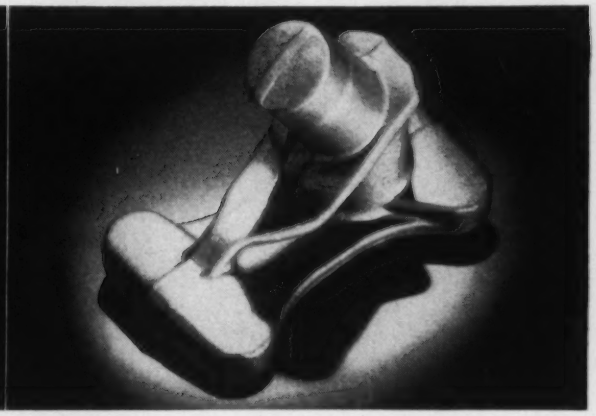
DRACCO airstream c[illegible]s
dust control [illegible]ment

FULLER COMPANY GENERAL [illegible]

IF IT'S FORGEABLE...
Get a Quote from WILLIAMS



Forged, trimmed, punched, shot blasted and coined



Forged, trimmed and shot blasted

COMPLETE FORGING SERVICE FROM DESIGN TO FINISHED PART

METALS

Ferrous Metals
- Carbon Steels
- Alloy Steels
- Stainless Steels

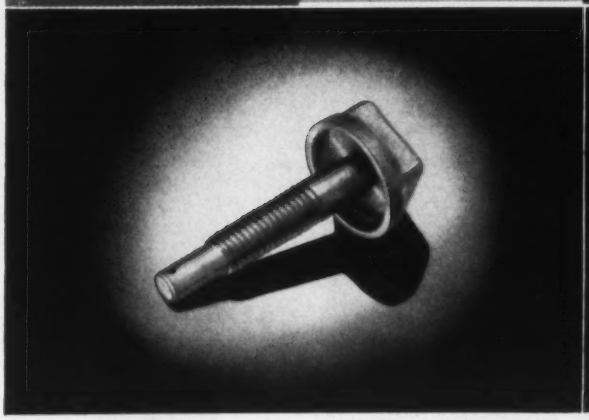
Non Ferrous Metals
- Aluminum Alloys
- Brass
- Bronze
- Copper
- Monel
- Titanium

FORGING METHODS
- Drop-Hammer
- Steam Hammer
- Mechanical Press
- Upsetting
- Coining
- Restriking
- Open-Frame Hammer

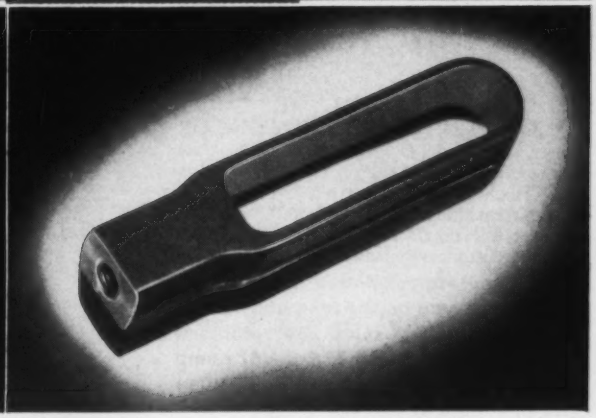
CLEANING METHODS
- Pickling
- Shot Blasting
- Grit Blasting
- Tumbling

HEAT TREATMENT
- Normalizing
- Annealing
- Spheroidizing
- Hardening
- Tempering
- Stress Relieving
- Austempering
- Pack Carburizing
- Liquid Carburizing
- Solution Treating
- Precipitation Treating

FINISHING OPERATIONS
- Broaching
- Milling
- Drilling
- Tapping
- Threading
- Turning
- Coining
- Grinding, Polishing
- Chrome-Plating
- Cadmium Plating
- Black Oxidizing
- Spray Painting



Forged, trimmed, shot blasted, turned, drilled, threaded and cadmium plated



Forged, trimmed, punched, shot blasted, broached, drilled, tapped and spray painted

WILLIAMS PRECISION FORGINGS

10 DAY QUOTATION SERVICE—Under normal conditions, quotations are mailed in 10 days or less from receipt of inquiry, provided all necessary information is furnished.

J. H. WILLIAMS & CO.
DIVISION OF UNITED-GREENFIELD CORPORATION
407 VULCAN STREET • BUFFALO 7, N. Y.

Please send your new Forging Design Manual No. 60 which includes all necessary design data—tolerance tables, standard practices, specifications, etc.

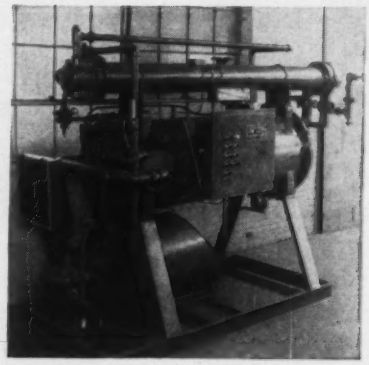
NAME_____ TITLE_____

FIRM _____

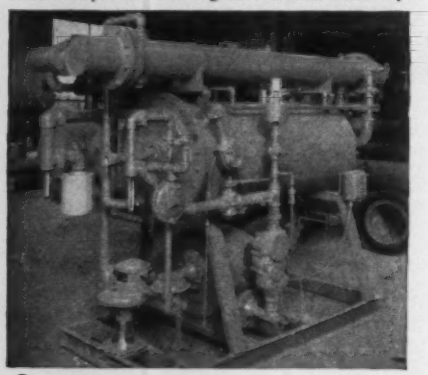
STREET _____

CITY_____ ZONE ____ STATE_____

Which of these 3 KEMP GAS GENERATORS *do you need in your plant?*

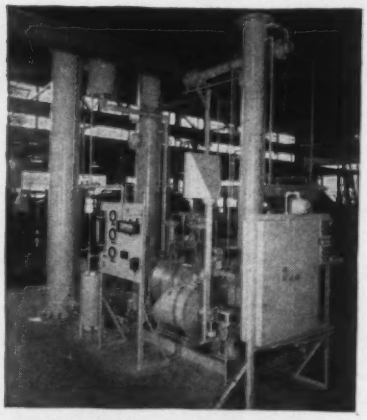


1 KEMP INERT GAS GENERATOR
—for working non-ferrous metals. Produces inert gases for use at low or high pressure, desiccated or unprocessed. Kemp gives you low-cost gas generation, completely automatic operation. Premixing in exclusive Kemp Carburetor and constant analysis assures highest thermal efficiency.



2 KEMP ATMOS GAS GENERATOR
—for working low-carbon steels. For gases low in carbon dioxide. As in all Kemp Gas Generators, test burner permits checking for proper combustion characteristics before igniting burners. Another safety feature: automatic fire-checks guard against flashback.

3 KEMP NITROGEN GENERATOR
—for working high-carbon steels. Completely eliminates CO_2 from gas, produces 99+% nitrogen. Features the easy start-up typical of all Kemp Generators. Vernier dial can be locked in position to maintain exact fuel-air ratio without further control manipulation.

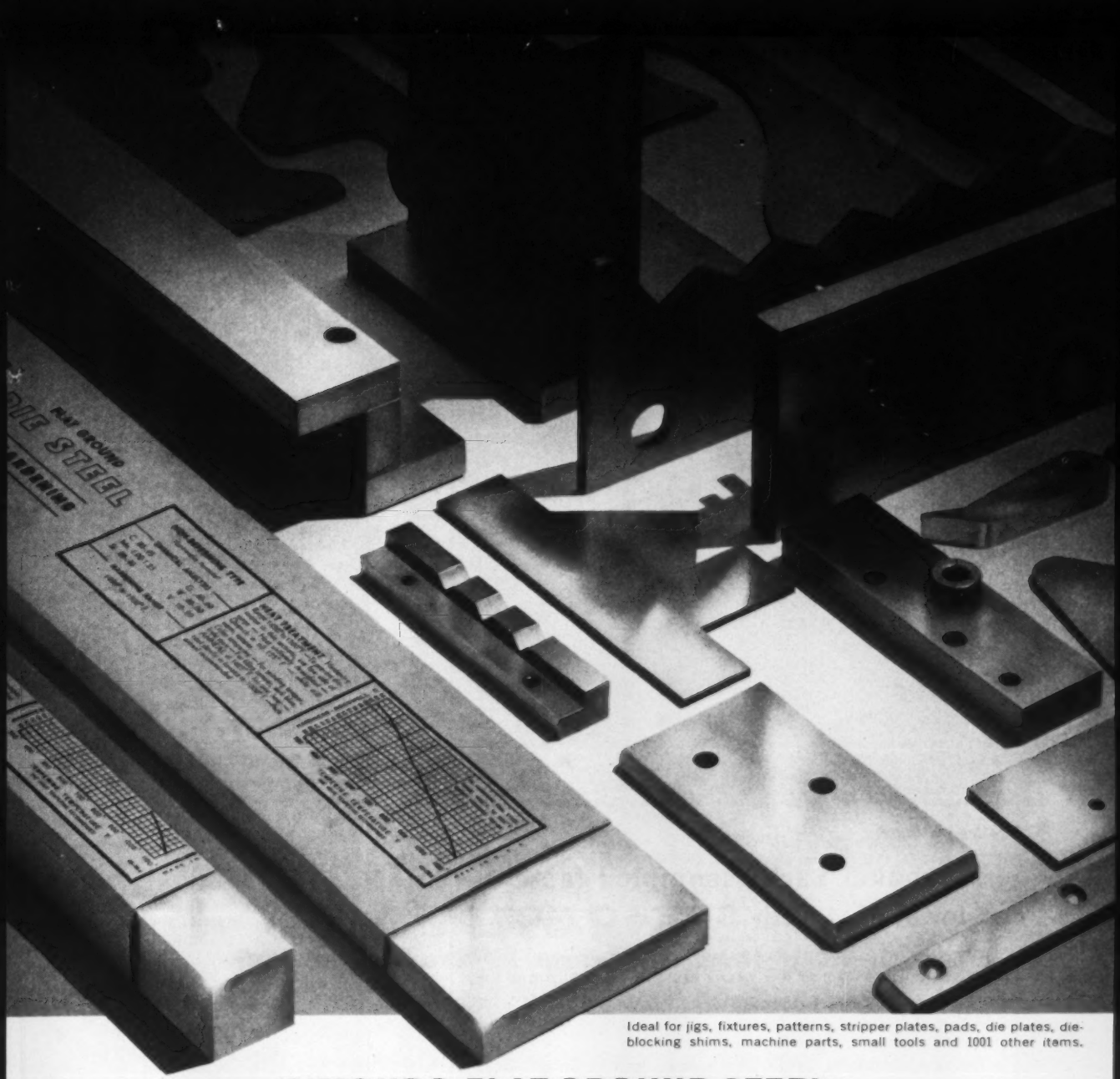


The Kemp representative in your area can advise you on the type and size of generator to best solve your problem. Talk to him or write: The C. M. Kemp Manufacturing Company, 405 E. Oliver St., Baltimore 2, Maryland.

It always pays to come to

KEMP OF BALTIMORE

THE C. M. KEMP MANUFACTURING COMPANY
405 E. Oliver St., Baltimore 2, Md.



Ideal for jigs, fixtures, patterns, stripper plates, pads, die plates, die-blocking shims, machine parts, small tools and 1001 other items.

SIMONDS FLAT GROUND STEEL

Means BIG Savings on Parts Like These

Imaginative metalworkers in many branches of industry are finding new economies in buying bar steel already finished to close tolerances. The fact is: for thousands of applications *it costs far less* to begin with Simonds high quality, precision-ground tool and die steel than to do the milling and grinding yourself.

What's more, you get a better piece of steel to start with. Dimensionally accurate, parallel and square. Spheroidize-annealed to make it more uniformly machinable, drillable, filable, sawable. And an extra smooth surface finish for easy layout.

Available in "1001" stock sizes — flats and squares — and 3 analyses. Think of the jobs you can use them on. Then check our prices and figure your savings in machining and grinding time and expense.

Oil Hardening (01 Analysis) for general use and average production runs. Spheroidize-annealed, easy to heat treat, standard 18″ and 36″ lengths.

Air Hardening (A2 Analysis) contains 5% chrome for extra wear resistance and long production runs. Spheroidize-annealed, standard 36″ lengths. 18″ lengths also available.

Low Carbon (Silicon Killed) a fine-grained, forging quality steel for items that don't require hardening. Standard 24″ lengths.

All types and sizes are individually packaged, labeled, ready to use and available "off the shelf".

Send for free "Data Book" listing all sizes, prices, chemical analysis, heat treatment and general information.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASSACHUSETTS

Buy through your local Simonds Distributor's — for Local Stocks — Local Speed — Local Skill

Factory Branches in Union, N. J., Chicago, Shreveport, La., Los Angeles, San Francisco, Portland, Ore. • Canadian Factory in Granby, Que. • Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.; Heller Tool Co., Newcomerstown, Ohio; Simonds Abrasive Co., Philadelphia, Pa. and Arvida, Que., Can.

A Tinnerman T-Marked Original...

Studebaker Lark assembled faster, at lower cost with SPEED NUTS®

The rear fenders of the new Studebaker Lark are secured in a vibration-proof, watertight seal with this special heavy gauge Tinnerman J-type SPEED NUT brand fastener. It eliminates rubber stripping and costly spot-welded bearing plates, and allows the fenders to be easily removed for repair.

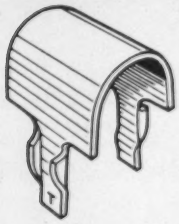
Preassembled to the Lark's rear quarter panel, the J-nuts hold themselves in place while the panel is first attached to the chassis. The fender is then positioned on the quarter panel and the acme bolts driven home.

In applications like this—where *total* fastener reliability is vital—Tinnerman SPEED NUT brand fasteners are your only choice. Only Tinnerman maintains *total* quality control from coil strip selection to finish coat. The Tinnerman T-mark on every fastener is your assurance of that quality.

For samples, literature, prices, call your Tinnerman sales office ... listed in the "Yellow Pages" under "Fasteners." Or write to: *Tinnerman Products, Inc., Dept. 12, Box 6688, Cleveland 1, Ohio.*

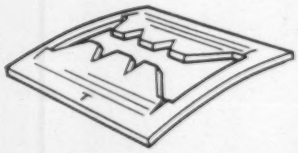
TINNERMAN
Speed Nuts®
Look for the Tinnerman "T"

T-MARK ENGINEERED SPECIALS



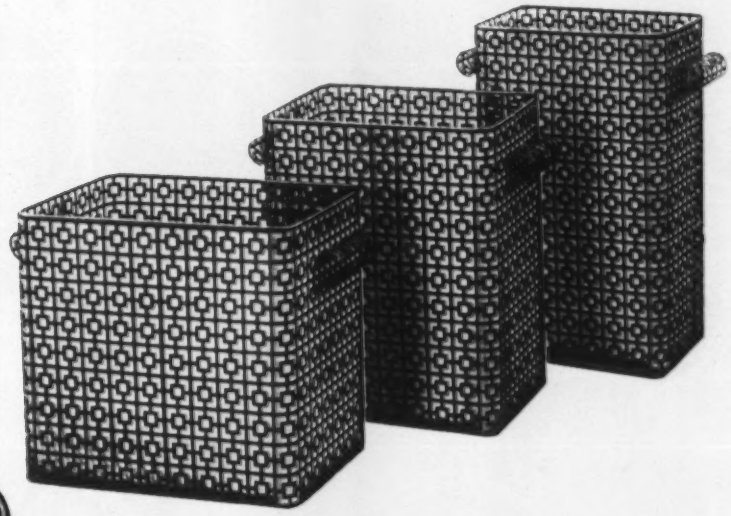
TUBE CLIP is designed for fastening refrigerant tubes to liners. A split rubber cushion insert is placed over the tube, and the entire unit is snapped into a rectangular mounting hole. Spring tension locks the legs in a strong, vibration-proof assembly. Has many application possibilities where tube, cable or wire must be secured.

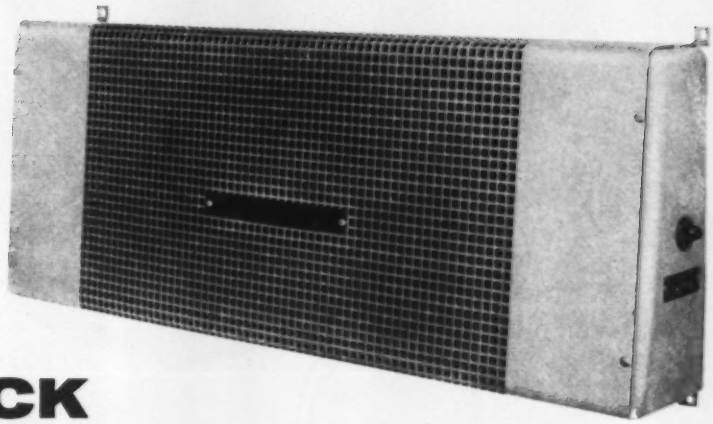
PRINTED CIRCUIT NUT provides positive contact between printed circuit panels and connecting wires. This highly-conductive, phosphor bronze fastener snaps firmly over terminal area, allows wiring connections to be made at any station on the assembly line. A screw through the eyelet wire completes the assembly. Easy to assemble ... easy to service.



RUBBER STRIP FASTENER locks bumper strips on a famous-name vacuum cleaner, can solve rubber-strip fastening problems in many fields. This SPEED NUT brand fastener is simply pushed over one end of the bumper strip. Triple-tooth prong secures strip firmly while bumper is wrapped around cleaner base and anchored with identical fastener. No special tools required.

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S.A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano Simmonds GMBH, Heidelberg.





HENDRICK ORNAMETAL...

lightweight metal designed for design engineers

You're a designer looking for a new material or method to make last year's product look brand new. Chances are you've been through this over and over again. You're really stumped . . . what can you do this time? Maybe Hendrick can help out. Often the inclusion of Hendrick perforated metal in a product's design not only helps increase its overall attractiveness but adds to its saleability as well!

Perforated metal, masonite, rubber, plastic and insulated board can be used in the fabrication of automobiles, furniture, buildings, appliances, notions, novelties, toys, machines and many other products. Hendrick has hundreds of attractive designs to choose from in commercially rolled metals and gauges to suit your exact needs. For more information on how Hendrick can help you out of a design slump, mail the attached coupon today.

HENDRICK Manufacturing Co. Carbondale, Penna.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens
Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro Dehazers

HENDRICK Manufacturing Company Carbondale, Penna.

Gentlemen:

☐ Please have representative call.
☐ Send me FREE literature on Hendrick Ornametal.

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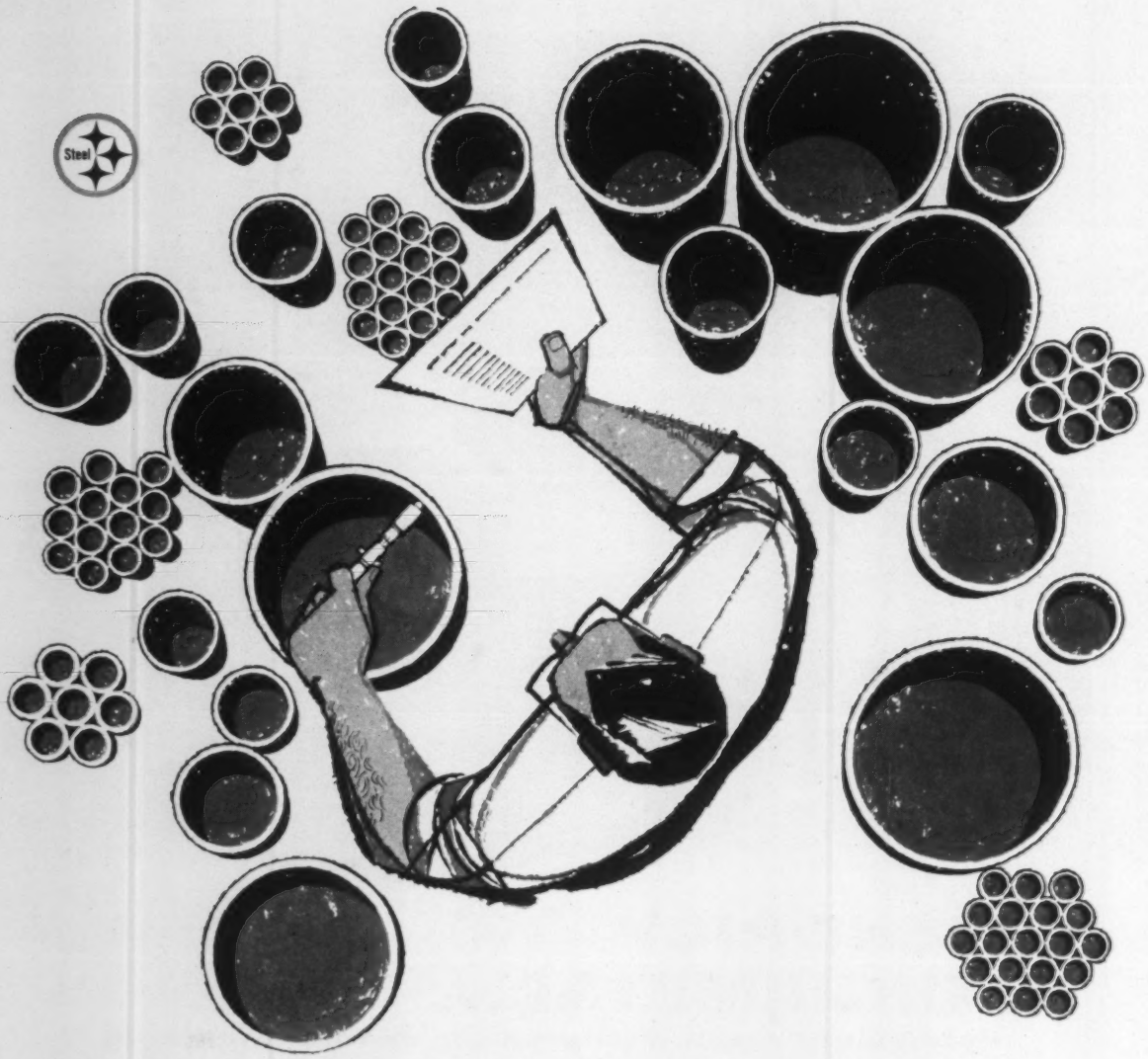

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Republic Steel Corp., Steel and Tubes Div. ♩ ♪
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The Standard Tube Co. ♩ ♪
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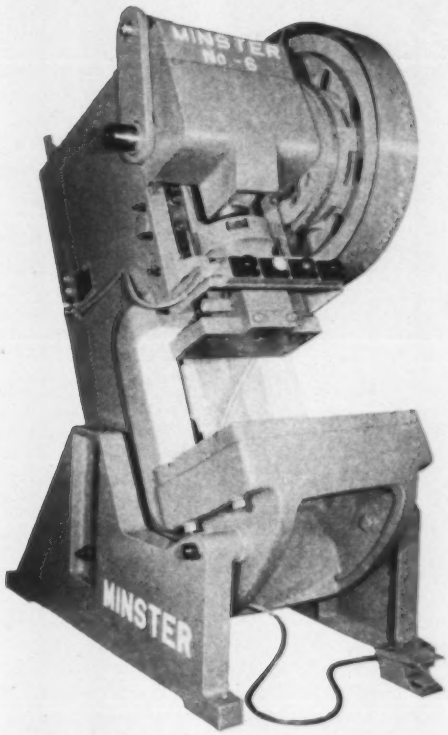
♪ PRODUCES WELDED STAINLESS STEEL TUBE
♩ PRODUCES WELDED CARBON STEEL TUBE

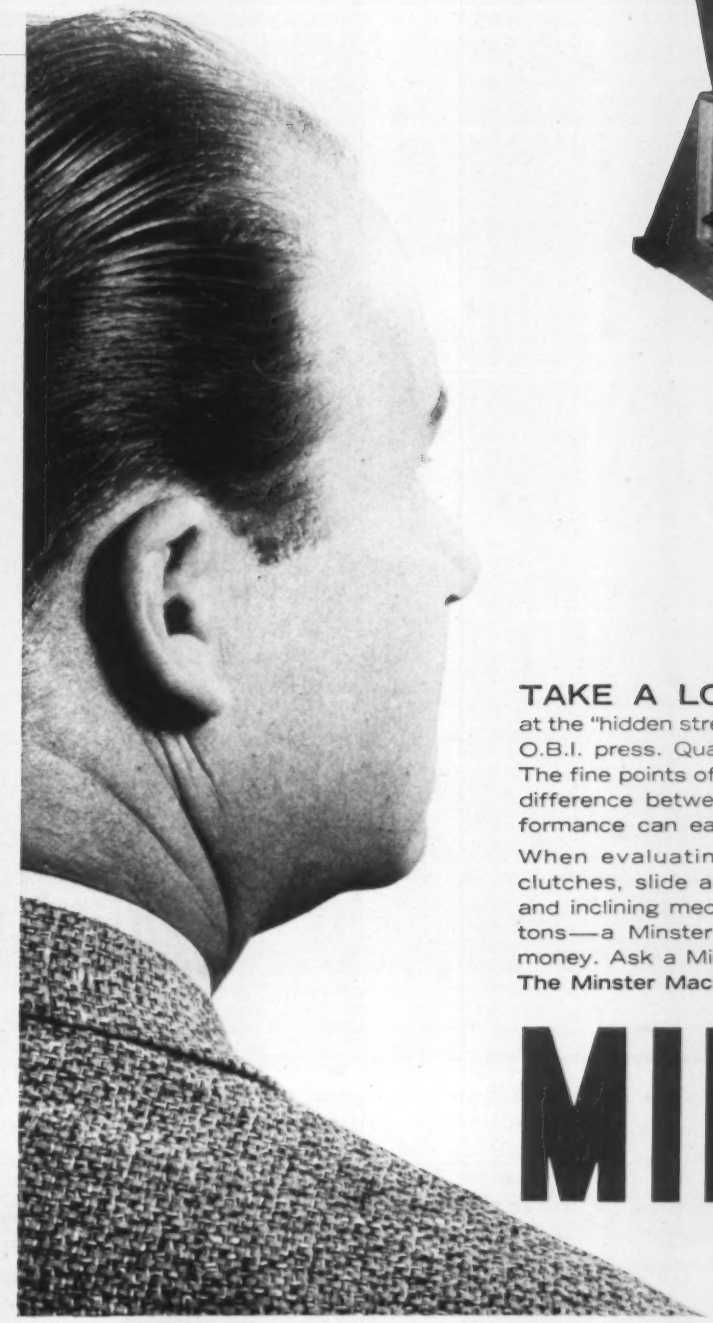
Here's the reason why you can count on welded carbon or stainless steel tubing in critical heat transfer applications: its method of manufacture, developed to high domestic standards, results in consistently reliable performance. Starting with clean, scale-free flat rolled steel the resulting tube surfaces are smooth, and free from scratches and pits. You are assured of concentricity, exact O.D. and I.D., precise wall thickness, and uniform ductility for bending or rolling in operations.

Whether you require carbon or stainless steel analyses, listed here are the quality welded tube producers ready to serve you. It will pay you to contact any of them or write for free Booklet 8591, Department IA-6, Welded Steel Tube Institute, Inc., Hanna Building, Cleveland 15, Ohio.

261

WELDED STEEL TUBE INSTITUTE, INC.





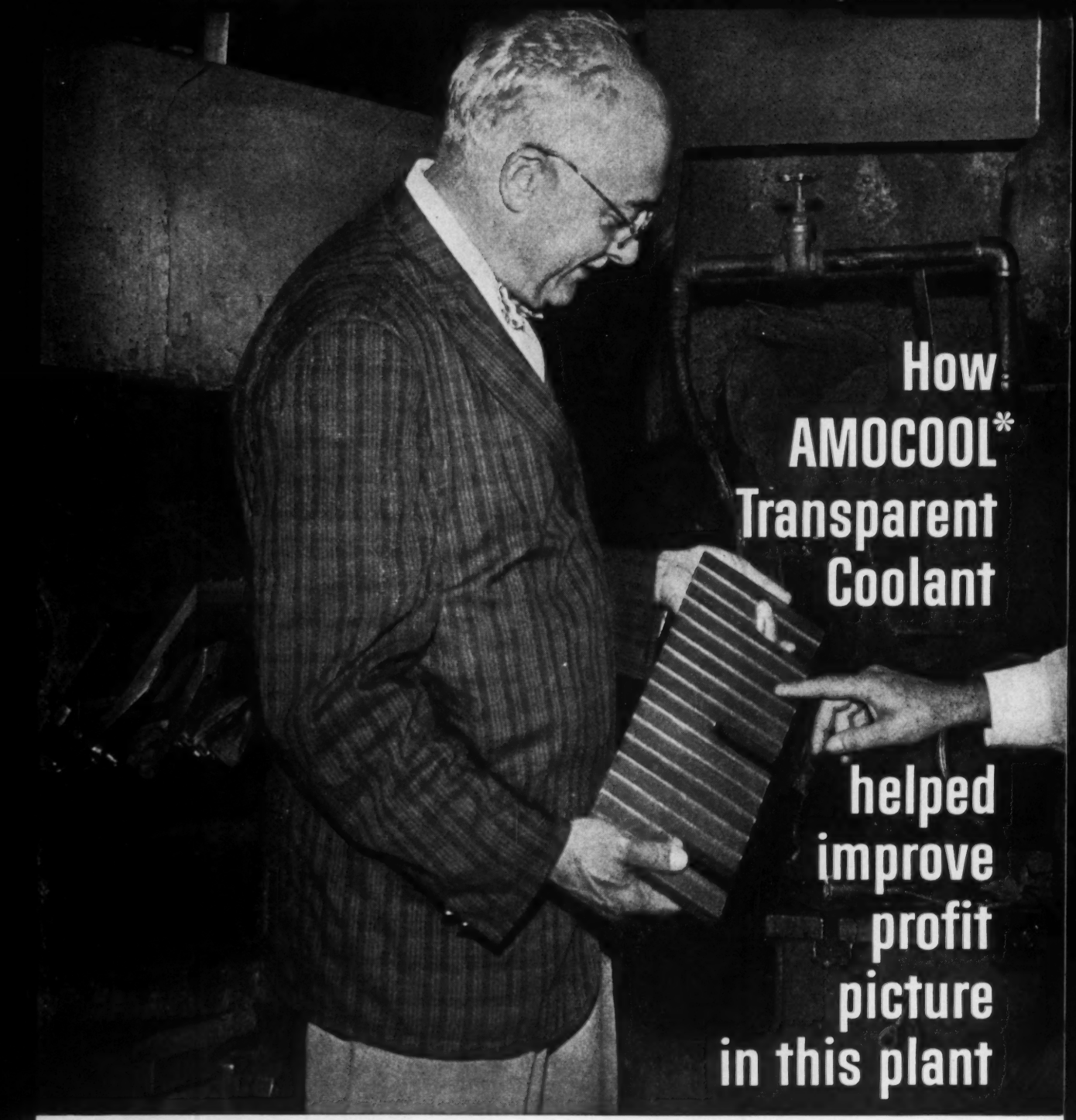
TAKE A LONG, HARD LOOK

at the "hidden strengths and values" found only in a Minster O.B.I. press. Quality is not always visible at first glance. The fine points of design and construction which mean the difference between good performance and superior performance can easily be overlooked.

When evaluating O.B.I. presses, carefully compare clutches, slide areas, recirculating lubrication systems, and inclining mechanisms. On any size—16 through 250 tons—a Minster O.B.I. offers you more value for your money. Ask a Minster representative to prove it.

The Minster Machine Company, Minster, Ohio

MINSTER®



How AMOCOOL* Transparent Coolant helped improve profit picture in this plant

*Trademark

BY PAUL E. "PAPPY" STRATTON

About the Author. "Pappy" Stratton has been providing technical help on lubrication and metalworking problems to customers in the Detroit area for nearly all of the twenty-five years he has been working for the company. In addition to having this store of practical experience to help him, Pappy has completed the Company's Sales Engineering School.

* * *

By using a soap-base grinding compound, Detroit Edge Tool Company was getting excessive corrosion and rust on work and grinding machines. Oil vapor was collecting on machines and on the ceiling, causing dirty working conditions. Most important, high wheel loading was causing frequent down-time for wheel dressings.

We worked out a test program on AMOCOOL Transparent Coolant with the management. On our first test on one surface grinder, feed pressure was cut substantially while at the same time metal removal was increased.

Eliminate reworking because of rust, reduce wheel loading and extend intervals between wheel dressings; do these and you increase profit per unit, explains Detroit Edge Tool president, Dan Ebbing, to P. E. "Pappy" Stratton of American Oil. Plant manager, John Yonker (right) and Sam Vineh, operator, look on.

The cost of reworking parts to remove rust was eliminated. Time required to clean machines to get rid of the odor was cut in half. Less wheel loading and fewer wheel dressings have upped production and reduced costs. Our test program paid out in an improved profit picture. All grinding and drilling equipment has been converted to AMOCOOL Transparent Coolant.

* * *

Would you like this kind of technical help to assist you in improving profits? Get it by calling the American Oil Company office nearest you.

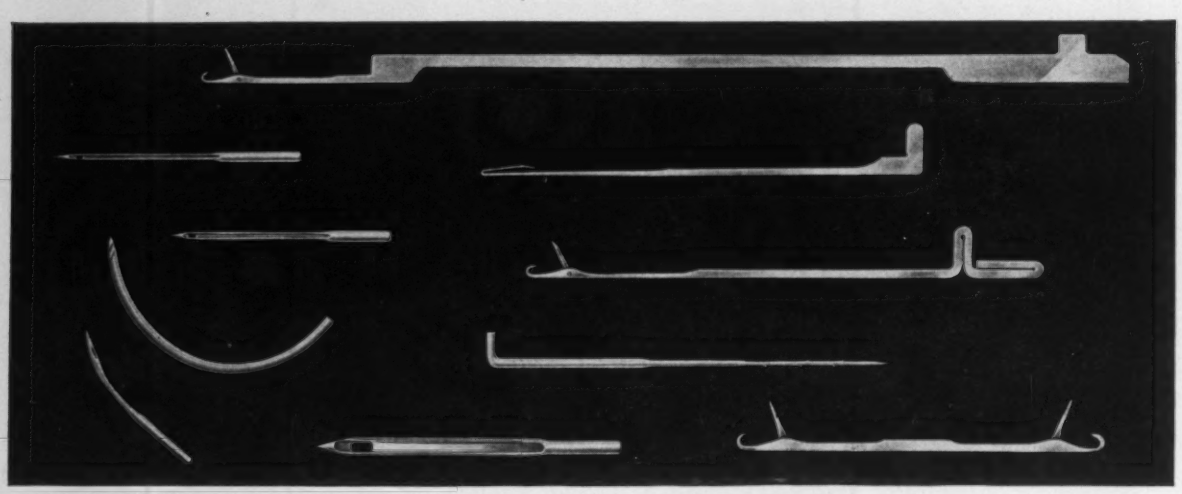
Quick facts about
AMOCOOL Transparent Coolant

- Clear, transparent fluid
- Controls corrosion on work and machines
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Fire resistant
- Odorless

AMERICAN

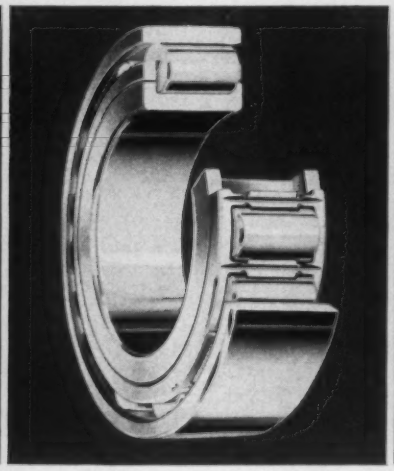
AMERICAN OIL COMPANY
910 South Michigan Avenue
Chicago 80, Illinois

YES, TORRINGTON MEETS EVERY NEED FOR MACHINE NEEDLES: KNITTING, SEWING, TUFTING, FELTING...

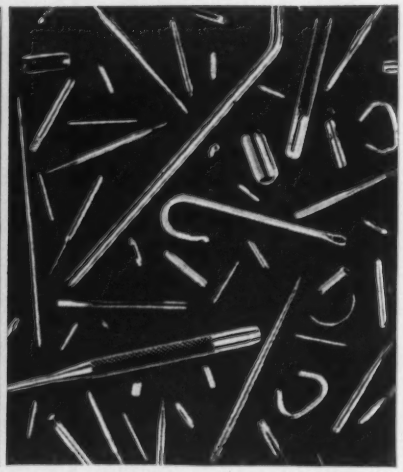


BUT THIS, TOO, IS TORRINGTON...

Outstanding maker of needle roller cam followers built to withstand heavy loads in aircraft, textile machinery and other equipment.



Precision manufacturer of radial roller bearings used for such heavy duty applications as steel rolling mill and oil field equipment.



Foremost producer of small precision metal parts, manufactured by the millions for use in countless industrial and consumer products.

In these and many other fields throughout the world Torrington is contributing to

PROGRESS THROUGH PRECISION

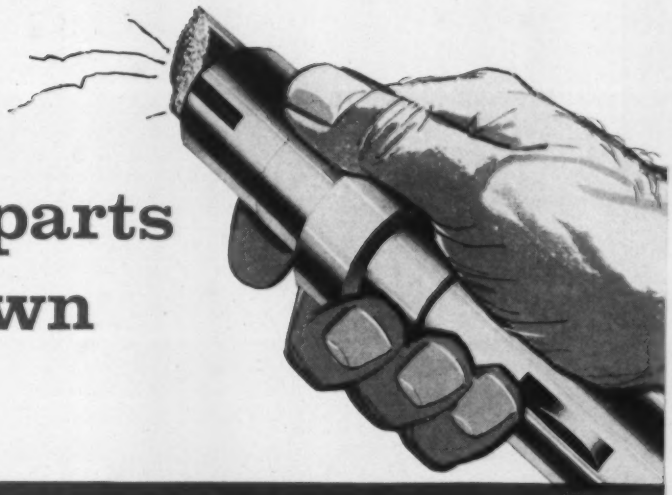
THE TORRINGTON COMPANY

Torrington, Connecticut

Serving industry from plants located in the United States, Canada, England, Germany and Italy

Maintenance Departments

make repair parts faster, cut down time with..



LaSalle all-purpose STRESSPROOF® STEEL BARS ...for maintenance

A broken machine part? You can cut your down-time from days to hours by machining your own replacement parts from LaSalle all-purpose STRESSPROOF. There's no need to wait for a new part to be shipped from the factory...or to put up with the delays of heat treating and secondary operations.

Here's why STRESSPROOF *will help you get back into production faster (and minimize future breakdown possibilities):*

- STRESSPROOF needs no heat treating. *Now available in sizes up to 4" rounds.*
- It machines faster . . . rated at 83% of B1112.
- It's strong . . . 100,000 psi.
- It wears better.
- It costs less than heat treated in-the-bar alloys . . . and you can make most of your parts from just one stock of all-purpose STRESSPROOF.

STRESSPROOF IS AVAILABLE FROM YOUR STEEL SERVICE CENTER

La Salle STEEL CO. 1436 150th Street Hammond, Indiana

24-Page booklet tells complete story of all-purpose STRESSPROOF

Use this coupon to request your copy of "How to make your own machine and repair parts quicker and easier." It tells how to make parts like these easier and faster: *arbors • axles • bolts • bushings • fasteners • gears • spindles • shafts • studs, etc.*

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

Adjustable From 1 to 15 Seconds

This new Allen-Bradley development should solve such occasional problems where, upon the operation of the push button or limit switch, a slight time delay should occur. Time delay is adjustable up to 15 seconds—and it can also be introduced when "stopping" the operation—but not in both the "starting" and "stopping" cycle.

Both push-button and limit switch are relatively low in cost—ideal for applications where a delay of only a few seconds is desired, and where the repetitive accuracy of the Allen-Bradley Bulletin 849 time delay relay is not necessary. Both units have single pole, double break contacts—either normally open or normally closed. They are no more difficult to install than the corresponding units without the time delay feature.

Machine tool and production system designers should have full information in their files on these new Allen-Bradley time delay push buttons and limit switches. It is yours for the asking. Write today.

ALLEN-BRADLEY

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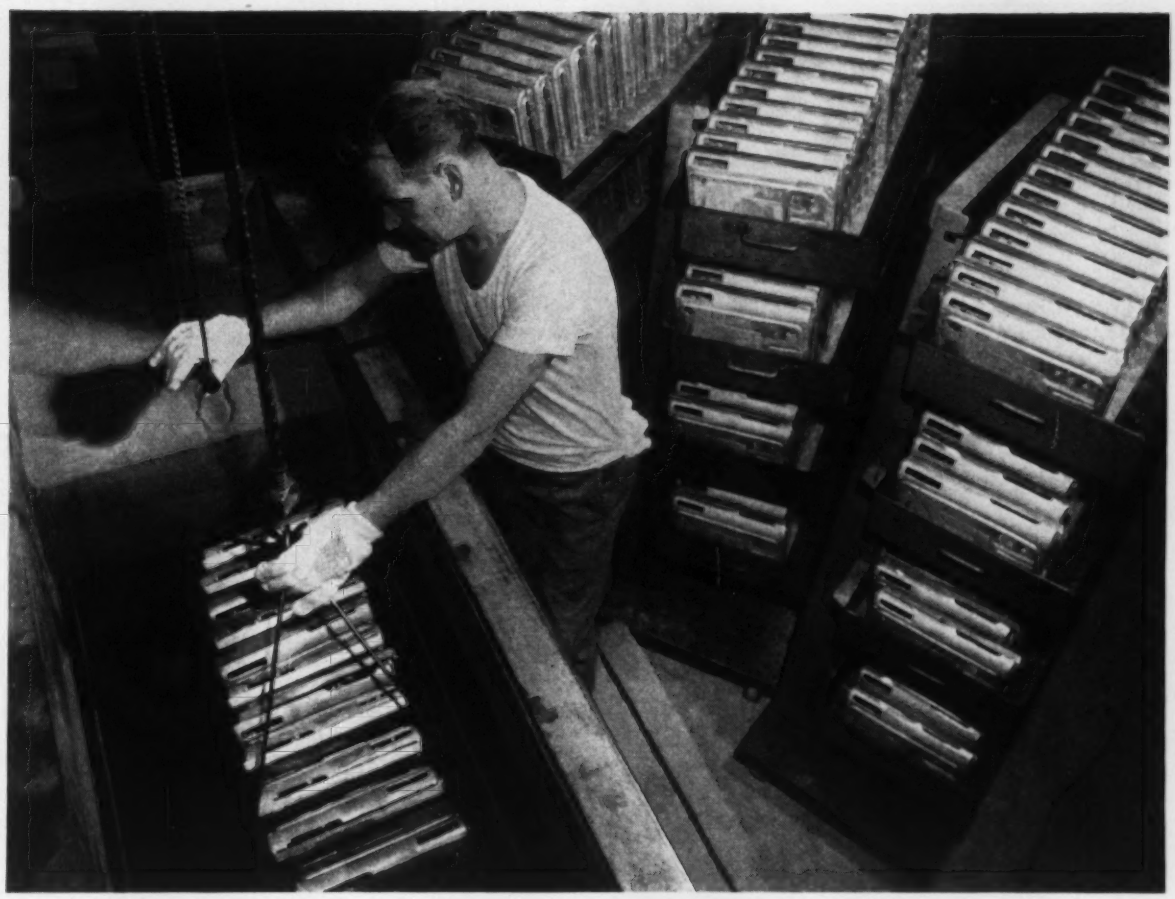
Allen-Bradley Co., 1321 S. First St., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

QUALITY MOTOR CONTROL



HOW VOICEWRITER CUTS DEGREASING TIME UP TO 50%

. . . and cleans parts spotlessly every time

Nearly every metal part on an Edison Voicewriter requires machining. "Since absolutely clean metal components are essential to the smooth operation of these fine machines," says Robert Spears, Voicewriter's factory superintendent, "we have to use a dependable degreasing solvent." Nialk® TRICHLORethylene is the one they've used for years.

"It's stable and safe," Mr. Spears says, "and certainly economical and efficient." He explained that only one degreasing in Hooker TRICHLOR is necessary, while many other types of cleaners require two. Degreasing time is perhaps one-half what it would be with another type of cleaner.

Even more important, according to Mr. Spears, is that Hooker TRICHLOR removes all soils *definitely*. There are no hidden pockets of dirt or grease to be picked up as rejects by inspectors or at the paint shop.

A specific property of Hooker TRICHLOR that particularly benefits Voicewriter production is its unique neutral stabilizer system. Since virtually all the metal parts on the Voicewriter are aluminum, it's important to see to it that the solvent doesn't turn acid. Hooker TRICHLOR satifies that requirement particularly well because the stabilizer has *psp*—permanent staying power.

Both degreasers at the Voicewriter plant are *original* equipment, indicating that the use of Hooker TRICHLOR has had no deleterious effect on the degreasers. One degreaser has been in service 20 years, the other 15 years—with no replacement needed or anticipated.

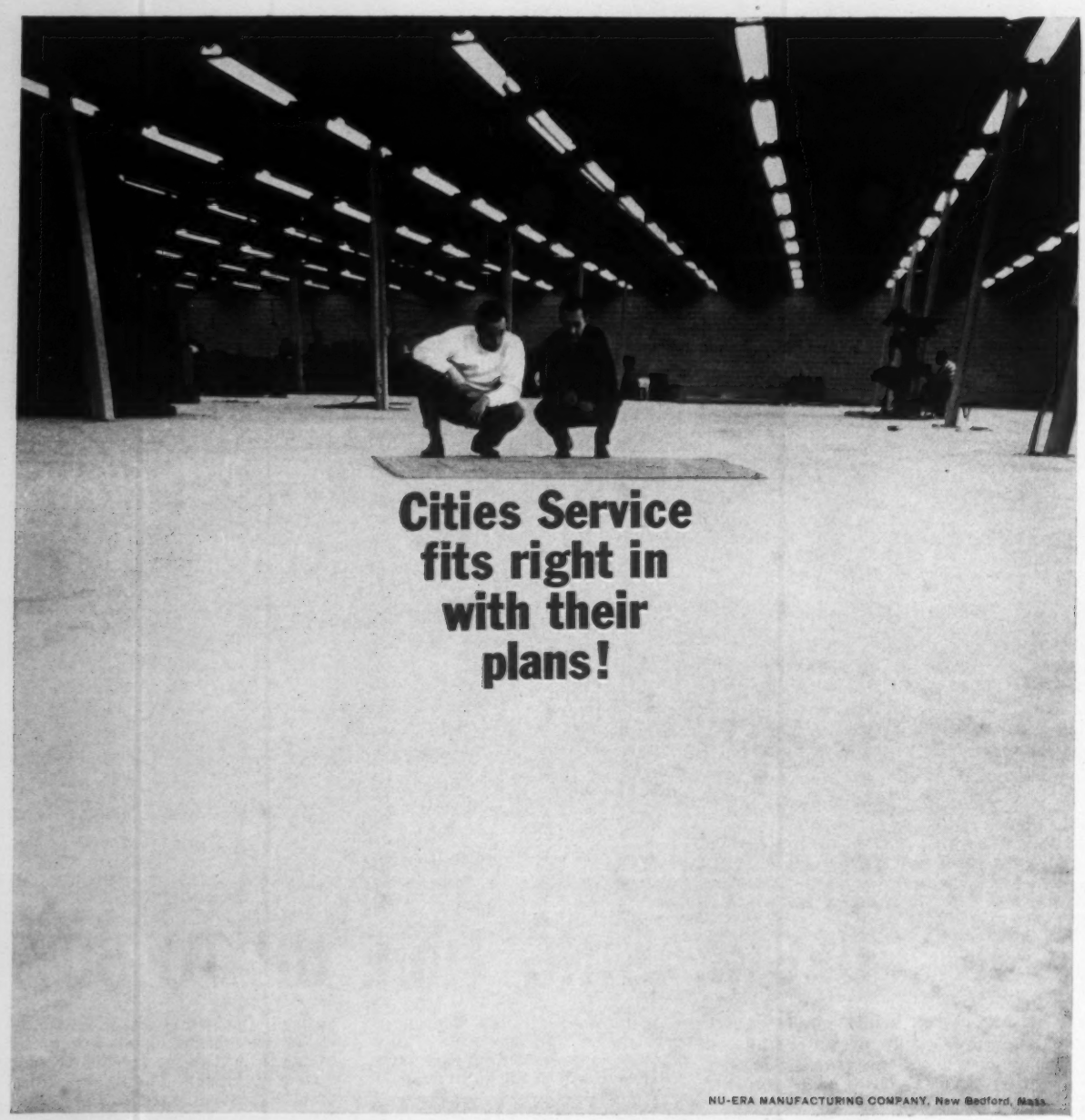
Whatever your metal, whatever your degreasing job, you can solve your cleaning problem with Nialk TRICHLOR. See your chemical distributor or drop us a line. Hooker experience is yours for the asking.

HOOKER CHEMICAL CORPORATION

310 UNION STREET, NIAGARA FALLS, NEW YORK

HOOKER CHEMICALS PLASTICS

Sales offices: Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma, Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B.C.



Cities Service fits right in with their plans!

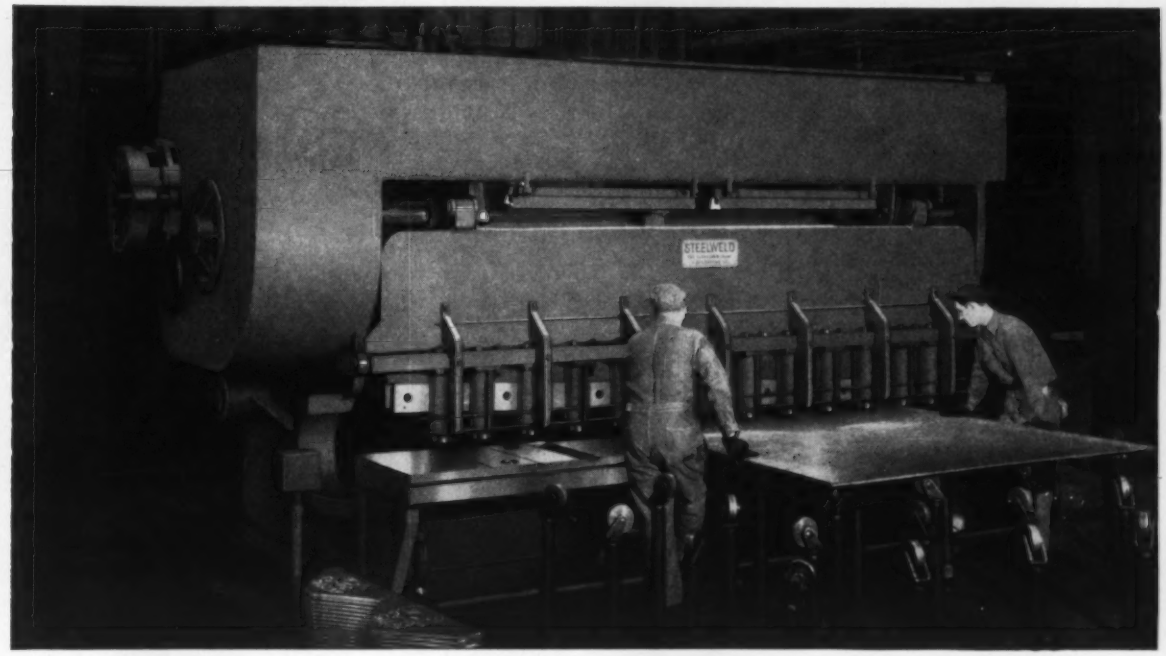
NU-ERA MANUFACTURING COMPANY, New Bedford, Mass.

There's a bright future ahead for Nu-Era, manufacturer of replacement gears. The firm recently built this huge plant to handle increased orders . . . and Cities Service definitely fits in with their plans. Says General Manager Bill Rebone, "At first, all cutting oil brands seemed to be the same. However, we soon realized that Cities Service oils were giving us superior performance in every respect. Most of our gears are made of #5135 steel, a real tough customer to work with. Yet, we find we're getting long tool life, extra clean cuts with Cities Service Chillo 30 Cutting Oil." Nu-Era now relies, exclusively, on Cities Service for their metal machining fluids. Find out how Cities Service can fit in with your plans. Simply contact your nearest Cities Service office or write: Cities Service Oil Company, 60 Wall Street, N.Y. 5, N.Y.

CITIES SERVICE

Out Front in Quality . . . Out Front in Service, too!

Better Cuts Make Better Fits for Road Machinery Builder



This rugged machine is in service two shifts — 16 hours a day — five days a week shearing parts of various thicknesses and shapes for heavy earth-moving equipment. It is rated for mild steel 12′ x 1″.

THE ease with which good, square, accurate cuts are obtained has made the Steelweld Shear of a road machinery manufacturer very popular with the operators and shop management.

Experienced with various type shears, they know the importance of easy knife clearance adjustment. They know that the best cuts are obtained when the correct clearance is provided for each thickness of plate being cut. As they point out, improper knife clearance on any shear often results in a heavy plate being cut at an angle with respect to the thickness, or light gauge metal burring.

Adjusting knife clearance on Steelweld Shears is such an easy, quickly-performed task that operators take care of it automatically. Turning a hand crank until a gauge pointer is on the proper metal-thickness figure is all that is necessary — a task done in a matter of seconds.

The big time saving made on knife changing as compared with most shears is another factor greatly appreciated. Easily done in two hours on a Steelweld, this job frequently requires all day on other machines.

Steelweld's unusual pivoted-blade operating principle makes possible outstanding cost-cutting advantages. For the complete story, send for the catalog below.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

4840 EAST 282 STREET, WICKLIFFE, OHIO

STEELWELD PIVOTED BLADE SHEARS

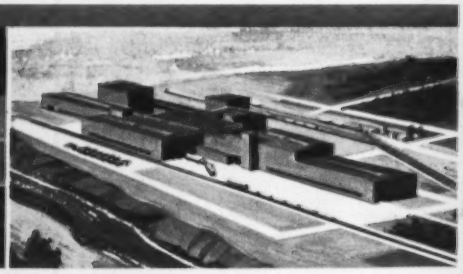
NATIONAL STEEL'S FAST NEW COLOR LINE

From this new automated finishing line at our Stran-Steel Division —the most advanced of its kind—stream the colorful pre-coated steel panels for our handsome Stran-Steel pre-engineered steel buildings. Stimulated by our pioneering of color, progressive designs and modern production techniques, demand for these modern buildings is flourishing. And this new 600-ft. color finishing line is providing effectively protected, uniformly color-coated steel building panels to meet the soaring demand more efficiently than ever.

Starting with zinc-coated coils that are first roll-formed, then cut into panels, our Stran-Steel Division's new line automatically processes the panels with a bond coat, an oven curing, multiple color coats and a second oven treatment via a unique 4-zone installation. Precision controls linked by twenty miles of wiring unerringly maintain the stringent specifications for paint pressures, oven temperatures and conveyor speeds. The result: Steel panels in any of ten long-lasting and attractive color finishes—all at a price per square foot that's just slightly higher than for galvanized steel alone.

FIVE OTHER MAJOR STEPS TO FURTHER PROGRESS

AT GREAT LAKES STEEL in Detroit, the computer-controlled and operated 80" Mill of the Future—fastest, most powerful hot-strip mill in the world—will provide more and better automobile body sheets.



AT MIDWEST STEEL near Chicago, the most modern and efficient steel finishing plant in existence is providing industry with the finest quality galvanized sheets, tin plate and, soon, hot- and cold-rolled sheets.

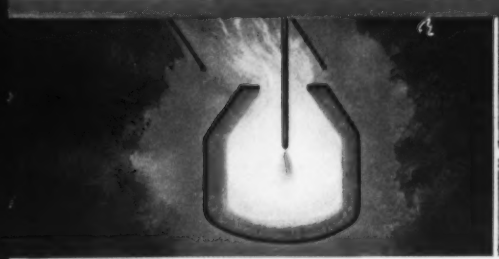
FOR PRE-COATED STRAN-STEEL BUILDINGS

This new finishing facility is one step in a program of progress throughout all divisions in which National Steel is investing well over $300,000,000. Among the far-ranging benefits: greater efficiency and stability throughout our operations; more secure jobs for our employees; more and better steel for our customers; and better values for you, the ultimate consumer of the million and one products made of steel. Other phases of this program will swing into action soon. And we will be bringing you news about them, too.

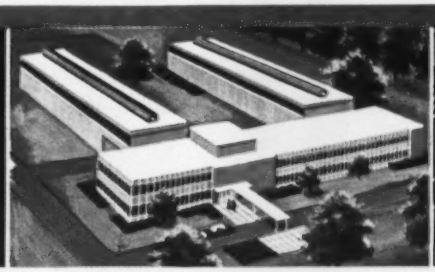
NATIONAL STEEL CORPORATION, PITTSBURGH, PA.

SUBSIDIARIES AND DIVISIONS:

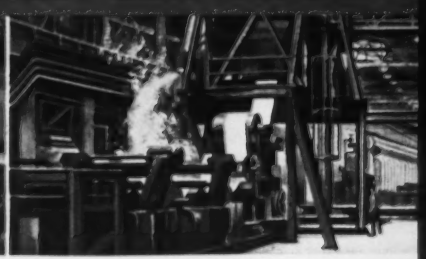
GREAT LAKES STEEL • WEIRTON STEEL • MIDWEST STEEL • STRAN-STEEL • ENAMELSTRIP • HANNA FURNACE • NATIONAL STEEL PRODUCTS



NEW BASIC OXYGEN FURNACES at Great Lakes Steel. Construction has started on two basic oxygen furnaces—to be the largest ever built—which will add new capacity and greater efficiency.



OUR NEW RESEARCH CENTER will be National Steel's headquarters for the expanded, continuing exploration of new and better raw materials, facilities, manufacturing processes and products of steel.



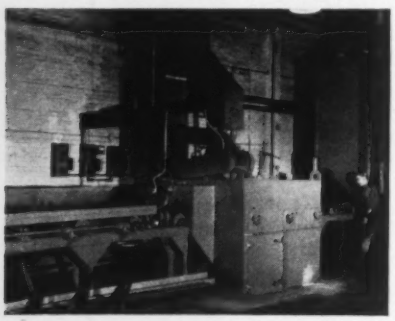
AT WEIRTON STEEL in Weirton, W. Va., new and improved facilities throughout this division increase the production and improve the quality of Weirton's tin plate, galvanized sheets and cold-rolled sheets.

Wheelabrator® blast cleaning permits faster better welding of structural steel

A demonstration of WHEELABRATOR'S

VITAL VALUES

Wheelabrator airless blast cleaning makes possible more positive, lower cost welding of steel angles into a square tube for a prominent farm equipment manufacturer. When manual wire brushing was used for cleaning the angles, a preliminary welding pass was required to burn out foreign matter and oxides. With Wheelabrator blasting cleaning providing a thoroughly cleaned surface, the joint weld can be applied to both sides on the first pass with approx. 50% penetration at each joint. Better, faster welding is just one of the many benefits obtained by cleaning structural steel to "white metal" with the Wheelabrator prior to fabricating. Write today for the complete story on the savings potential with the Wheelabrator.



Faster, better welds are obtained on steel angles as a result of the thoroughly cleaned surface provided by Wheelabrator blast cleaning.

WHEELABRATOR

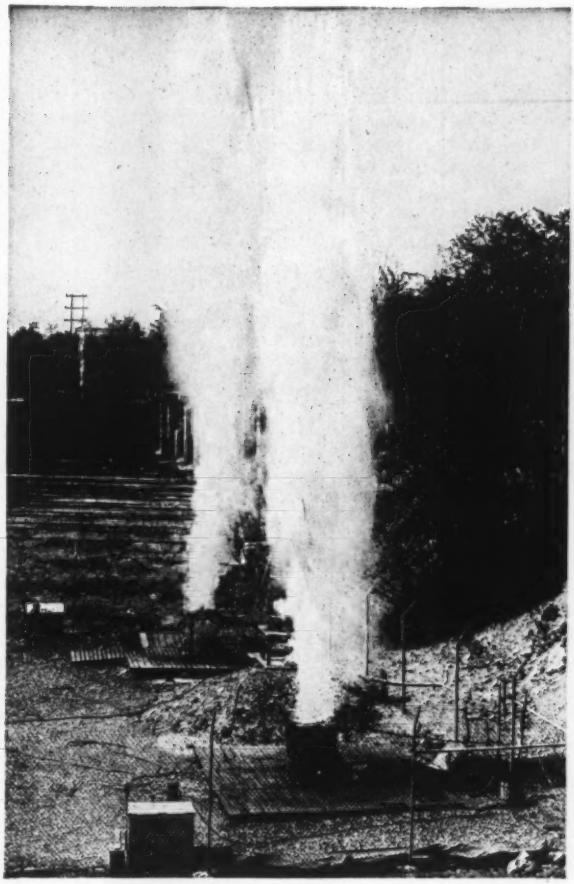
AIRLESS BLAST EQUIPMENT

VITAL VALUES FOR INDUSTRY

W

WHEELABRATOR CORPORATION, 510 S. Byrkit St., Mishawaka, Indiana, In Canada, WHEELABRATOR CORPORATION OF CANADA, LTD. 1901 Birchmount Rd. P.O. Box 490, Scarborough, Ontario

A subsidiary of Bell Intercontinental Corp.



how Parish ingenuity reduced a forming operation to 1/1,000 of a second!

Operator removing an outer warhead shell formed and shaped by explosives.

problem: How to reduce the time and cost involved in forming large aluminum alloy missile warheads.

solution: Parish research engineers reduced the forming rate of aluminum inner and outer warhead shells to 1/1,000th of a second with explosives. A split die equipped with vacuum seals and an open top was used, with water serving as a transmitting medium for the Primacord explosive. Parish ingenuity dramatically reduced forming rates while keeping springback and work hardening to a minimum.

Parish facilities, skill and ingenuity have materially reduced time and cost on thousands of intricate production problems. If you have a production problem—large or small—requiring stamping, machining, forming, heat-treating, welding, balancing, forming and assembling, why not insure top-flight quality and performance by calling Parish today?

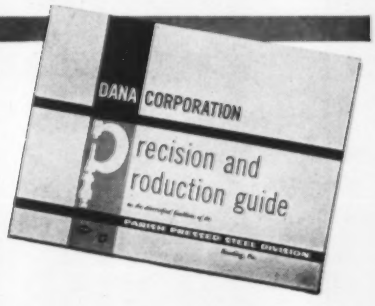
Write for your copy of this illustrated booklet describing the diversified facilities available to you at Parish.

This is IARI Test Ad #71

PARISH

PRESSED STEEL

DIVISION OF DANA CORPORATION • READING, PENNSYLVANIA



Plants grow better beside water

That's because an abundance of water is necessary for plant life. And those that have their roots at the water's edge can devote full attention to the problems of productivity.

Since 1953, more than 3,000 new plants have located on the Mississippi River System alone, not to mention the Great Lakes, the Gulf and numerous other rivers. Why? Mostly it is a matter of the "cost of living." Process water and plant utilities can be obtained economically; raw materials and finished products can be moved in and out at low cost.

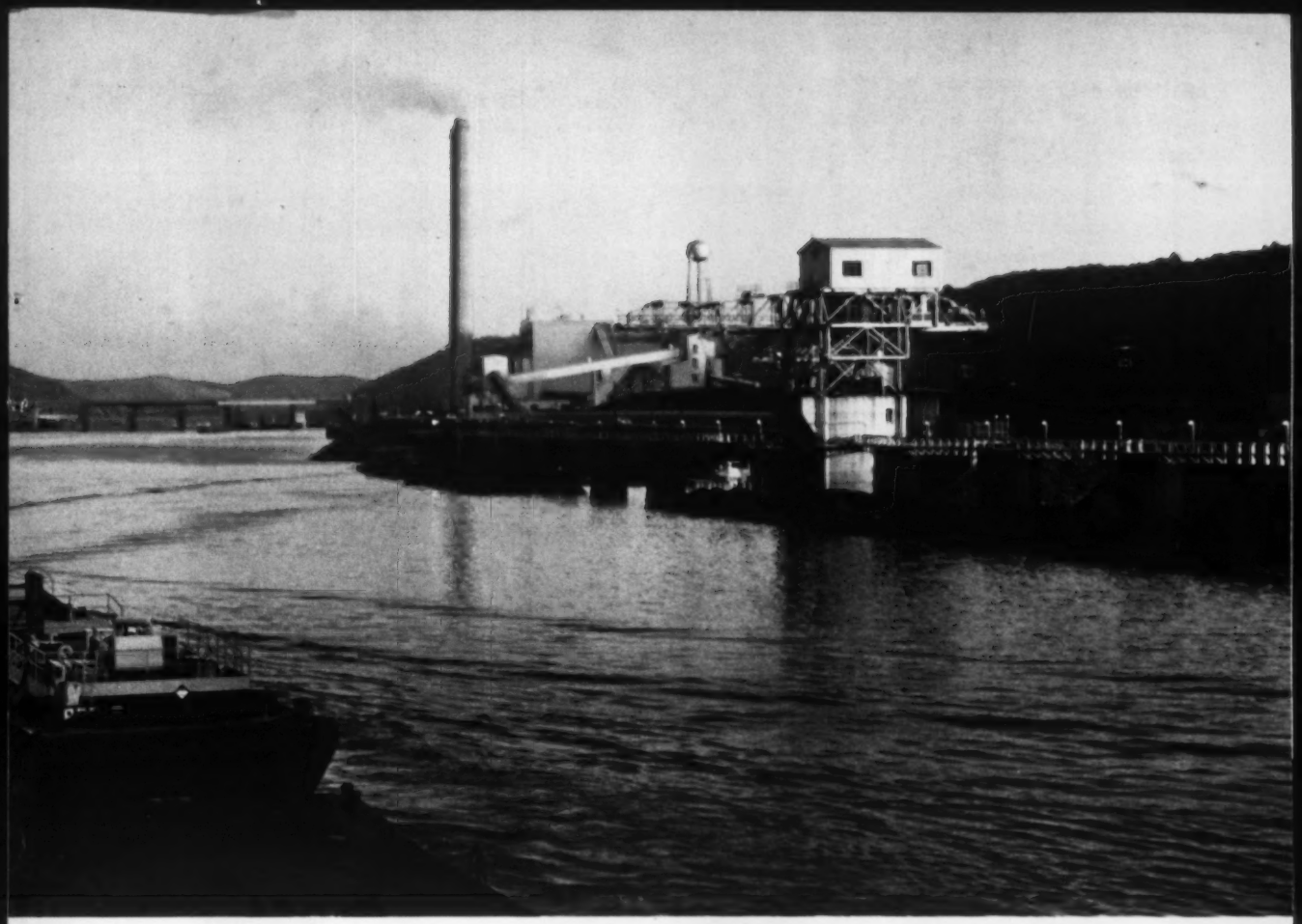
If you are considering a waterside location, or plan to expand or modernize an existing plant, you are invited to call on Dravo's 60 years' experience in and around water. Work has been performed for the U.S. Army Corps of Engineers in every one of the past 60 years, including many lock and dam projects in the continuing program for improvement of the country's inland waterways system. Another activity is production and marketing of river sand and gravel. Hundreds of industrial plants are served by Dravo-built docks. Ships and barges laden with ore, coal, bauxite and other bulk cargo are unloaded by Dravo materials handling equipment.

Pumphouses and water intakes, water and waste treatment facilities, steam or power generating plants, fabricated piping are also company specialties. Towboats, tugboats and barges launched at the Pittsburgh or Wilmington shipyards move almost every type of water-borne commodity. A subsidiary, Union Barge Line, offers common-carrier and contract transportation service on the Mississippi River System and Gulf Intracoastal Waterway.

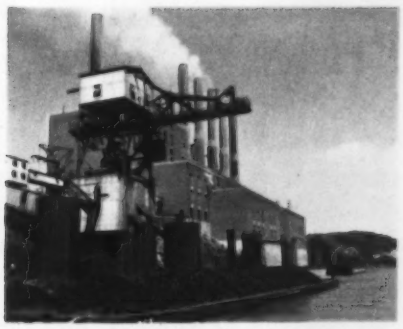
The coupon can be used to obtain more information on these activities.

Marine construction experience includes giant dam and lock projects—commercial installations of all kinds.

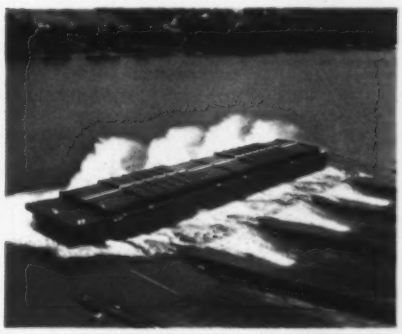
Twin high-speed river towboats built for a New Orleans transportation company.



A Union Barge Line tow carries products of many industries.



Generating station, dock and unloader built on turn-key basis.



A covered hopper barge is launched at Neville Island shipyard.

Dravo Corporation, 4790 Grand Avenue, Pittsburgh 25, Pa.

Please send me information on the following products and services:

☐ Pumping Stations & Intakes	☐ Oxygen Steelmaking	☐ Steam & Power Plants
☐ Sewage & Water Treatment	☐ Ore Bridges	☐ Towboats & Barges
☐ Coal & Ore Unloaders	☐ Shafts, Slopes	☐ Fabricated Piping
☐ River Transportation	☐ Grating	☐ Container Cranes
☐ Sintering & Pelletizing Plants	☐ Space Heaters	☐ Compressor Stations
☐ Docks, Harbors, Foundations	☐ Oxygen Plants	☐ Process Machinery

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

DRAVO

BETTER PROFITS THROUGH BETTER TOOLING WITH CARBOLOY® CARBIDE PLUSES

CARBOLOY®, THE METALLIC VITAMIN FOR INDUSTRY

Carboloy cemented carbide disposable inserts . . . the metallic vitamins of industry . . . demonstrate their superior quality in the bonus work output per cutting edge. Multiple reasons explain their efficiency. One important factor is pre-honing a precise radius around the complete perimeter of the cutting edges. This factory process is designed to reduce chipping and increase predictable tool life. Worthwhile savings in time and money result.

For steel-cutting applications, Carboloy inserts are available pre-honed. All Series 78 grades for normal steel cutting come pre-honed. The 300 Series for heavy-duty applications are available pre-honed, precision-ground or utility-ground. Like to know more about these features, designed to help you gain *better profits through better tooling?* Call your Authorized Carboloy Distributor or write: *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Ave., Detroit 32, Michigan.*

CARBOLOY. CEMENTED CARBIDES

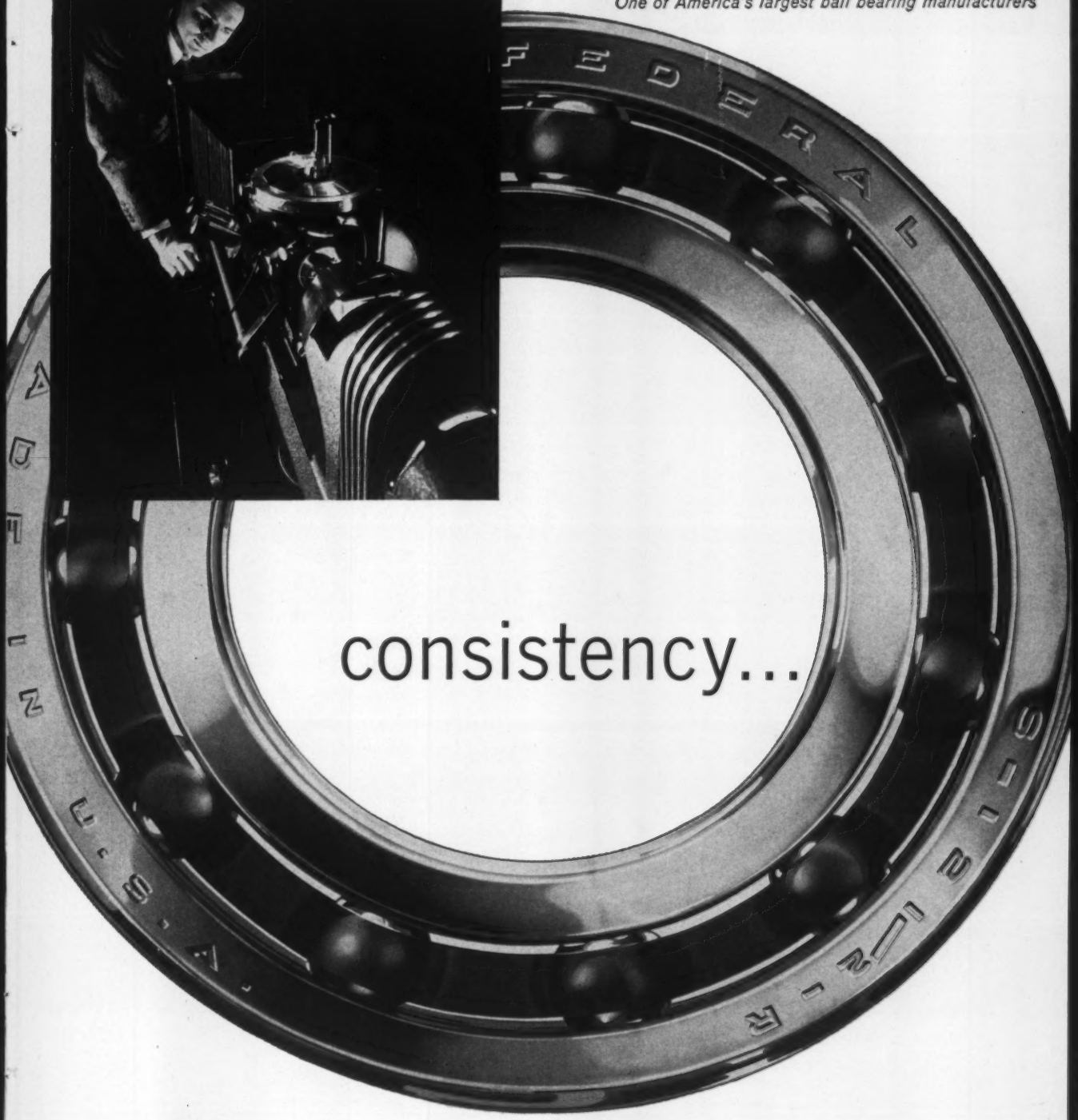
METALLURGICAL PRODUCTS DEPARTMENT

GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

Federal
BALL BEARINGS

One of America's largest ball bearing manufacturers



consistency...

Dependable, year-in, year-out performance of a Federal ball bearing starts with the uniformity of the steel we use. Even the finest SAE 52100 stock must pass our own exhaustive examination before it qualifies. Chemical analyses. Hardness tests. And here, in a photo-micrograph machine, which magnifies 2000 times, a photo-analysis of the metal's micro-structure is being made—just to be sure. Shows you the standard of excellence we demand of our ball bearings—radial, angular contact, thrust, self-aligning or shafted. Single or double row. Open or sealed. Hundreds of types, in all sizes. Send for our catalog today. The Federal Bearings Co., Inc., Poughkeepsie, N. Y.

MAY WE ADD YOUR FASTENER "SPECIAL" TO OUR 12,000

This STEELMARK of the American Steel Industry tells you a product is made of Steel. Look for it when you buy.

Steel

OR FORMED PART PIECE SHOWCASE

Pictured here are a few of the more than 12,000 different fastener and formed part "specials" we've produced for hundreds of satisfied customers. Result: our Special Products Team has the problem-solving know-how to tackle any product requirement that a standard fastener or formed part can't handle.

We'd like to put this experience to work for you—add your "special" to our showcase of precision parts—and prove that we can save you money in the process.

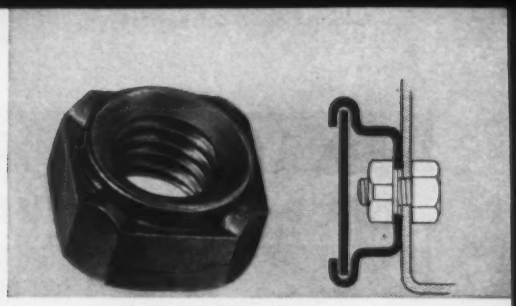
Republic does the job the way that's best for you. We'll completely design, engineer and produce your special—make it from your blueprints, to your specifications—or, produce blanks that are ready for your finish machining.

Newest methods and facilities keep costs down. Cold forming, hot forming, extruding, upsetting (and combinations of these methods) are used to best advantage. Complete machining, heat treating, and surface finishing equipment are also available. Savings realized from this single-source operation mean lower costs to you.

For complete information on Republic's unique capabilities for producing your Fastener and Formed Parts "Specials" send the attached coupon today.

REPUBLIC STEEL

REPUBLIC HAS THE FEEL FOR MODERN STEEL



BLIND FASTENING APPLICATIONS are no problem with Republic Midland Weld Nuts—newest addition to the more than 20,000 different types and sizes of Republic Fasteners. They save time, cut costs. Simply premount in places where a wrench can't reach, spot weld in seconds with standard projection welding equipment. Circular pilot guides Republic Midland Weld Nuts into position, protects threads, simplifies automatic feeding. Send for data.

CUT THE COST of keeping pace electrically—build in future power capacity with Republic E.M.T. Here's how: for the same price (or even less in many cases) that it would cost for ordinary threaded conduit, you can install Republic ELECTRUNITE® Electrical Metallic Tubing in the next larger size. And, with E.M.T., you have a pull-in, pull-out wiring system that can be expanded simply by adding or replacing wire. Send coupon for more information on E.M.T.

EASY TO FABRICATE, bend, flange, weld, Republic ELECTRUNITE® Stainless Steel Tubing is ideal for a variety of design and engineering requirements. Republic combines leadership in the production of welded tubing, and in stainless and alloy steels to give you close-tolerance I.D. and O.D. concentricity, uniform metallurgical and mechanical qualities. Call your Republic Representative for fast service—price and delivery quotations to you within 24 hours. Mail coupon for more information.

REPUBLIC STEEL CORPORATION
DEPT. IA-2190-B
1441 REPUBLIC BUILDING
CLEVELAND 1, OHIO

Please send more information on:

- ☐ Fastener and Formed Parts "Specials"
- ☐ ELECTRUNITE Electrical Metallic Tubing
- ☐ ELECTRUNITE Stainless Steel Tubing
- ☐ Republic Midland Weld Nut

Name_____ Title_____

Company_____

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Poly-V Drive on giant Erie Foundry 2500 ton automated press

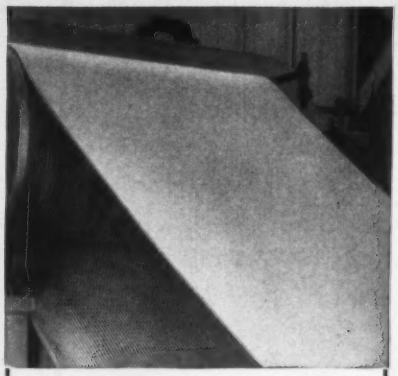
Rugged POLY-V® DRIVE Delivers More Power in Less Space... with More Reliability

R/M Poly-V Drive employs a *single*, endless V-ribbed belt across full width of sheaves with mating grooves. All parts of the belt work *together* to increase drive capacity—deliver more horsepower per inch of drive width than ever possible with conventional multiple belt drives. Only Poly-V* offers these exclusive advantages:

- **Simplicity**—just *two* belt cross sections meet *every* heavy duty requirement
- **Reliability**—less maintenance, less take-ups . . . less wear on belts and sheaves
- **No Matching**—not an assembly of V-belts . . . single unit belt eliminates length matching problems.
- **Better Performance**—maintains groove shape, complete contact-pressure, constant pitch and speed ratios . . . runs smoother, cooler under *all* drive loads.

WHEN YOU CHANGE DRIVES . . . CONVERT TO POLY-V *AND BE SURE!*

*Patented



MORE USE PER DOLLAR

Change-over to R/M Poly-V Drive now delivers "power plus" on this rugged hot saw drive at one of the country's largest steel mills. Ask an R/M distributor about Poly-V for *your* installations . . . or write for new Bulletin M141.

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION • PASSAIC, N. J.
ENGINEERED RUBBER PRODUCTS

Super-Strong HOMOFLEX Air Hose is Flexible as a Rope

Easiest handling hose made for use with air tools. Homoflex is strong, flexible . . . yet *weighs less* than any other hose for equal working pressure. Homoflex is also made in types for water, other fluids and gases.

- **Super-Strong**—assures longer, trouble-free service life
- **Precision Built**—with super-strength low-stretch cords
- **Mandrel-Made**—no pre-set twist
- **Kinkless**—coils and uncoils freely in any direction
- **Homogeneous Construction**—provides inseparable tube-to-cover bond
- **Safer, Easier To Couple**—inside and outside diameters are uniform

Let an R/M distributor show you the advantages of Homoflex and other R/M hose constructions for *your* service requirements. Write for Catalog M5.

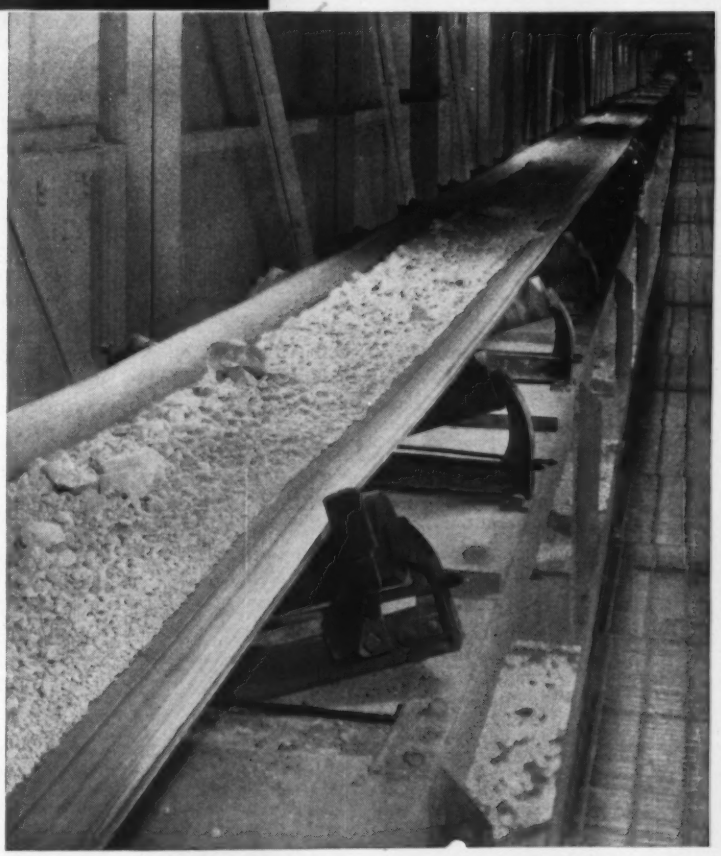
Deeper Troughing RAY-MAN Conveyor Belt Trains Easier—Hauls More

Ray-Man has the flexibility and troughability to haul fuller loads—even with small pulleys, reverse bends, snub or take-up pulleys. Compare its exclusive advantages:

- **High Cover-Adhesion All Around**—top, bottom, and edges
- **Full Cover Thickness Used**—no breaker needed—longer cover life
- **Splices Last Longer**—hold fasteners better
- **More Troughable and Trainable**—highly flexible, double compensated
- **Ideal for 45° Idlers**—guaranteed against separation at idler hinge line
- **Operates on Smaller Pulleys**
- **Impact Cushioned**—resists ripping

R/M's exclusive "XDC" Cover gives *extra* protection against wear and tear. Talk to your R/M distributor . . . or write for Bulletin M302.

RM124



Burst-test for cylindrical-pressure vessels fabricated from USS 9% Nickel Steel, cooled to —320°F, then pressurized to bursting. This one was quenched and tempered—not stress relieved.

Same vessel after bursting at a pressure of 2,160 psi—almost 6 times the design pressure of 370 psi.

Operation Cryogenics—Success story of USS

Destruction tests on welded tanks holding liquid nitrogen prove that vessels made from quenched and tempered or double normalized and tempered 9% Nickel Steel, *without* post-fabrication stress relieving, equal—and often exceed —the performance of vessels made of the same steel, which are stress relieved after fabrication.

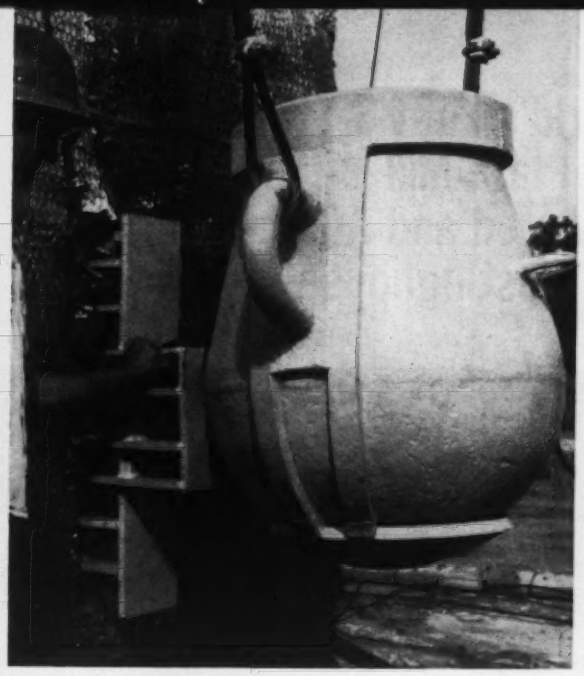
Recently, a series of impact and burst tests, known as "Operation Cryogenics," were performed on 9% Nickel Steel pressure vessels at the Fairless Works of United States Steel. The science of cryogenics, involving the development and practical utilization of materials in extremely low-temperature service, has assumed major importance in industry and in national defense. Much preliminary and advanced development work has been done cooperatively by The International Nickel Company, Inc., The Chicago Bridge & Iron Company, and United States Steel Corporation.

Objectives of "Operation Cryogenics" were to demonstrate (1) the suitability of 9% Nickel Steel, quenched and tempered or double normalized and tempered, in the as-welded condition (not stress relieved), for very low-temperature use; (2) the excellent properties of quenched and tempered 9% Nickel Steel; (3) the ductile behavior of 9% Nickel Steel in the as-welded condition during enforced failure at very low temperature; (4) the behavior of 9% Nickel Steel in the stress-relieved condition for very low-temperature use.

Test conditions: Two basic types of vessels were tested—rectangular vessels 8 feet square and 6 feet high simulating a type that might be used for shipboard transportation of liquefied gases, and cylindrical vessels 4 feet in diameter and 13 feet long with hemispherical heads such as are used for land-based storage and transportation of liquefied gases. All vessels were welded from economical 9% Nickel Steel plate $\frac{3}{8}$" thick, from the same heat of steel.

A total of nine vessels was built for the test. Five were made from 9% Nickel Steel plates and forgings in the quenched and tempered condition (QT) and four in the double normalized and tempered condition (NNT). Further, six of the vessels were tested as welded (AW), without any heat treatment after fabrication. Three were stress relieved (SR).

Impact test results. Impact testing of the three rectangular vessels, refrigerated with liquid nitrogen to –320°F, illustrated that 9% Nickel Steel vessels are capable of undergoing extensive plastic deformation even at extremely low temperatures. The vessels were repeatedly impacted both under pressure and without pressure by blows exceeding 80,000 foot-pounds. One quenched and tempered vessel did not fail, despite 7 impacts. Results clearly indicated the ability of quenched and tempered 9% Nickel Steel vessels in the as-welded condition (not stress relieved) to withstand impacts far beyond any which are likely to occur in service.



4340-pound wrecking ball used in striking rectangular vessels from varying heights.

Impact Test—Rectangular vessel of 9% Nickel Steel quenched and tempered but not stress relieved, refrigerated to —320°F. Withstood severe impact of 82,460 foot-pounds and did not fracture, proving superior strength and toughness of the steel.

9% Nickel Steel Tanks punished at -320°F.

Burst test results. The cylindrical vessels were designed for 370 psi internal pressure (hoop stress in shell equal to 23,750 psi). These vessels were refrigerated to -320°F with liquid nitrogen and pressurized to failure. *The burst pressure for all vessels was at least four times the design pressure of 370 psi and one of the non stress-relieved vessels didn't burst until 2,300 psi.* (See Table I)

These tests prove that USS 9% Nickel Steel has the high strength, toughness, and weldability needed for low-temperature pressure vessels.

We urge you to consider USS 9% Nickel Steel for economical low-temperature vessels. For the complete story, write to United States Steel, Room 6212, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

BURST TESTS 9% NICKEL STEEL CYLINDRICAL VESSELS

	PC-1	PC-2	PC-3	PC-4	C-5	PC-6
Heat Treatment	QT	NNT	QT	NNT	QT	NNT
Test Condition	AW	SR	SR	AW	AW	SR
Temp of Vessel (°F) at start of test	—308	—320	—320	—320	—320	—322
Temp. of Vessel at Failure (°F)	—304	—320	—311	—310	—302	—314
Burst pressure (psi)	2,275	1,550	2,125	2,300	2,160	2,100
Burst stress (psi)	135,510	92,920	129,800	135,730	132,500	129,100

TABLE I. Complete data are shown for burst testing of the cylindrical vessels. In each test, the vessel was filled with liquid nitrogen, supply valves were closed, and pumping continued to build up pressure to bursting point. The data show quenched and tempered (QT) or double normalized and tempered (NNT) vessels in the as-welded (AW) condition withstood greater burst pressures and stresses than did the stress-relieved (SR) vessels.

IMPACT TESTS 9% NICKEL STEEL RECTANGULAR VESSELS

	PR-1	PR-2	R-3
Heat Treatment	QT	NNT	QT
Test Condition	AW	AW	AW
Impact number	#9 of 11	#5 of 6	#7 of 7
Vessel Temp. (°F)	—293	—317	—308
Height of Drop, ft.	19	19	19
Kinetic energy of 4340 lb. weight (ft-lb)	82,460	82,460	82,460
Impact Velocity of 4340 lb. weight (fps)	35	35	35
Vessel pressure before Impact (PSI)	106	100	0
Total indentation after test (inches)	2.44	1.38	3.38

Table II. Data are shown only for the impacts which resulted in cracking or fracture of vessels PR-1 and PR-2. The two vessels were subjected to repetitive tests under increasingly severe impact and pressure conditions, leading up to the test which finally enforced failure. Additional impact tests were conducted on the failed vessels to determine further distortion and dimensional effects. For vessel R-3, which did not fail, data are shown only for the last impact.

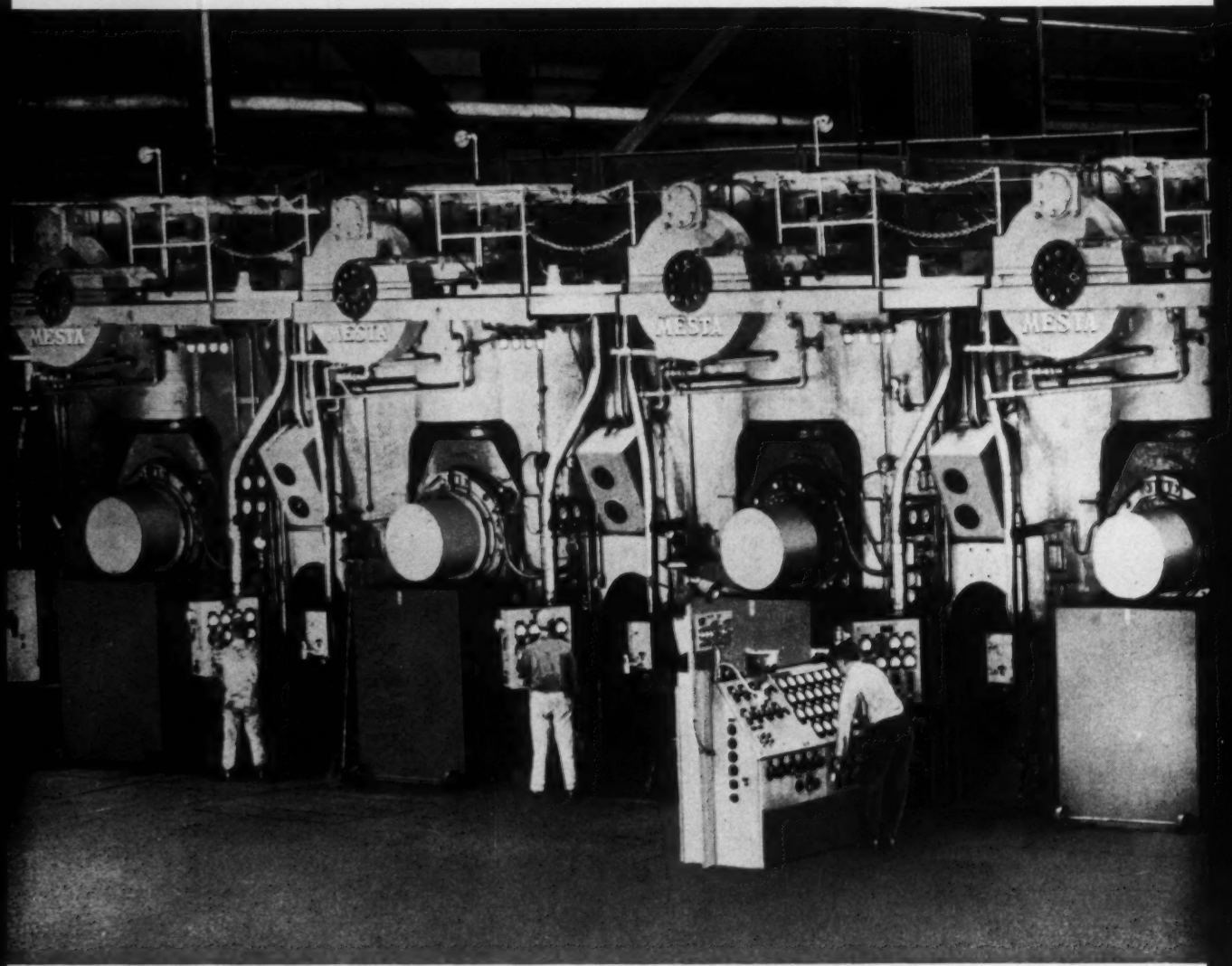
For *maximum* strength . . . toughness . . . safety

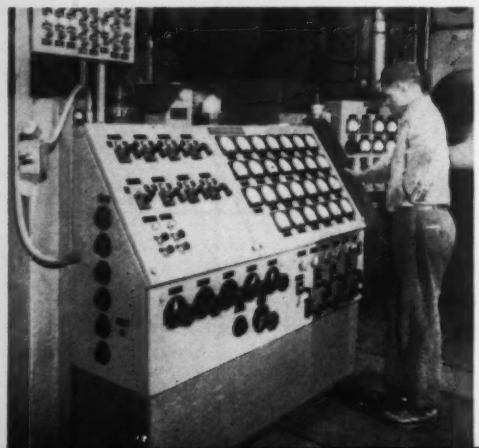
United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

USS

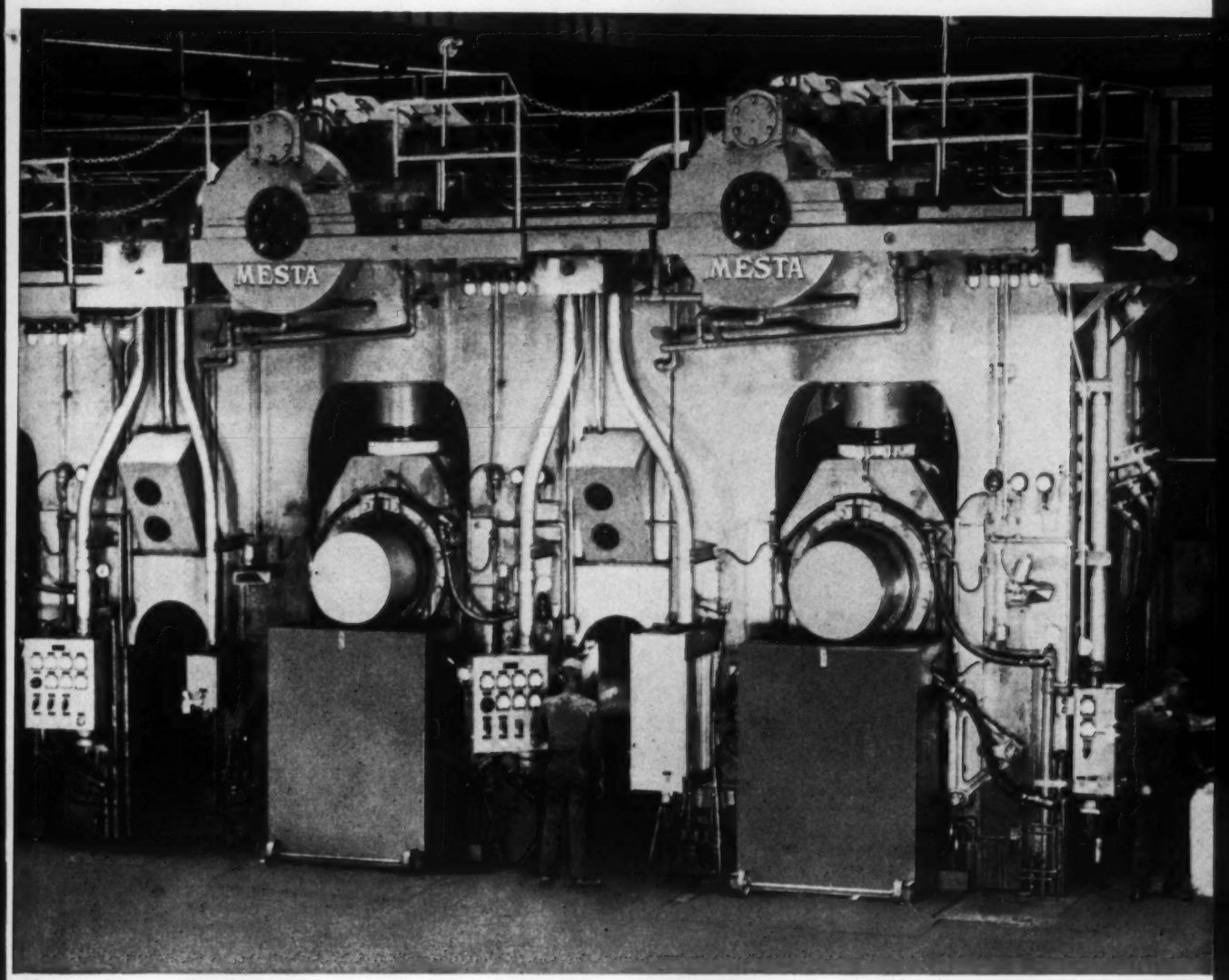
World's First 6-Stand Tin Plate Mill... Powered and Automated by Westinghouse





Above—Front view of 6-stand mill showing individual stand controls and Master Roller's desk.

At Left—Close-up of Master Roller's Desk. All supervisory mill controls are centralized here.



Speed: 7,250 feet per minute
Size: 6-stand 52″ tandem cold mill
Power: 34,900 main drive hp
Thickness Range: .035 to .0035

Early this year, The Youngstown Sheet & Tube Company began rolling tin plate from a new mill at Indiana Harbor. The mill is the largest and fastest such facility installed to date, and also the most completely automated installation of its kind.

All six stands are governed by Magamp magnetic amplifiers, which accurately regulate the response of motors and power supply generators. Automatic gauge control with completely static circuitry assures uniform strip through each stand, and maximum on-gauge finished strip at maximum rolling speed. Every factor in the rolling process is supervised by instruments and controls at the master console. Data logging equipment provides a complete record of gauge, width and inspection information for each coil as it passes through the mill. Data is accumulated as the coil is run, and automatically typed for order processing and record keeping. A total of 18 items of information are recorded plus inspection faults detected.

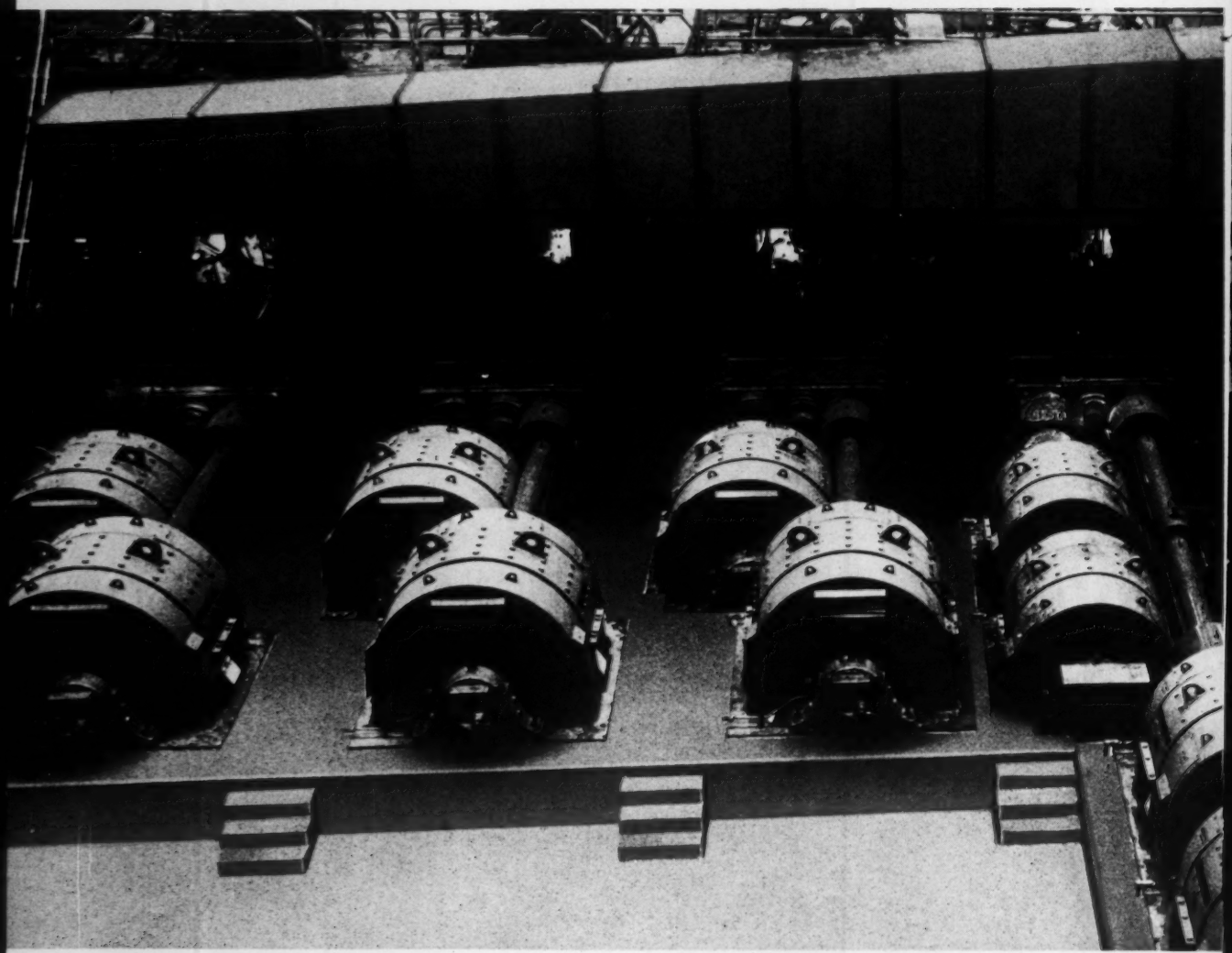
Virtually all control circuitry is entirely static. Magamp regulation requires no interposing exciters or complex damping circuits. This basic simplicity assures extremely high accuracy and reliable performance throughout the rolling cycle.

From the planning stage to start-up of the new mill, a *(continued on next page)*

First 6-Stand Tin Plate Mill

One of the three main power supply Westinghouse Motor-Generator sets located in the mill area. This MG set has a total of 8800 kw, is driven by a 12,000 hp synchronous motor.

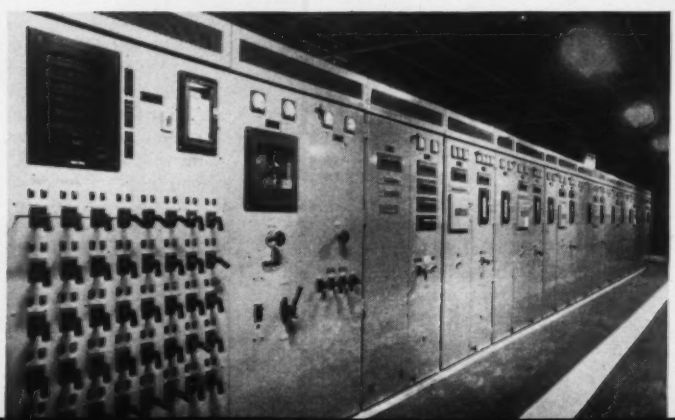
Below—Drive view of Youngstown Sheet and Tube's new 6-stand tandem cold mill. Westinghouse main mill drives range from 3000 hp (Stand #1) to 7500 hp (Stand #6). Twin, twin double armature and twin triple armature drives plus reel drive total 34,900 hp.

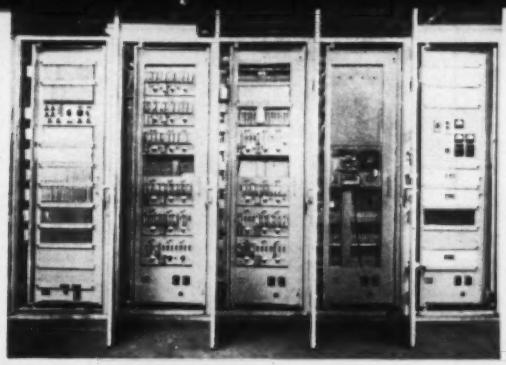


Westinghouse project coordinator followed every aspect of the job, working with the machinery builder and mill personnel. Weeks before start-up, Westinghouse specialists began training Youngstown crews in operating the complete mill and its control systems. The reward for these efforts was a remarkably trouble-free start-up.

The Westinghouse team of specialists in power and controls accepts one-source responsibility right from the start. Contact your Westinghouse sales engineer for details, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

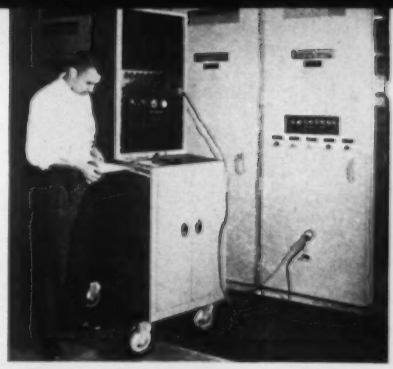
You can be sure . . . if it's Westinghouse.





Westinghouse's PRODAC* all-static system handles automatic gauge control and total data logging functions for the high-speed mill. Readout covers 18 points of information plus recording any inspection faults detected.

* Trademark



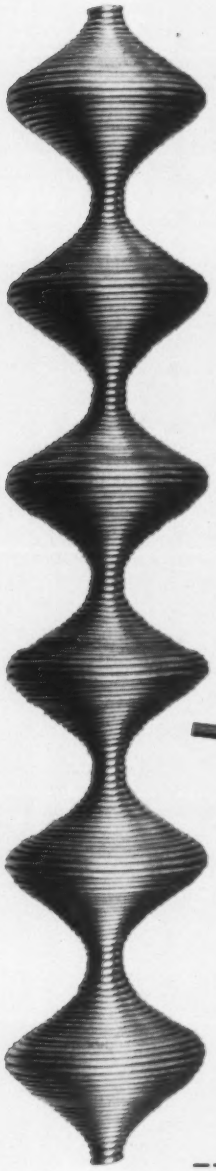
Westinghouse PRODAC design incorporates mobile test console pictured. Unit permits convenient changes in mill set-up, or quick circuit checks through front mounted plug-in shown.

Interior view of control house on mill floor. Cabinets shown house Westinghouse Main Drive Controls.

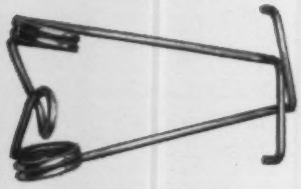
View of Westinghouse equipment located below mill floor. The only auxiliary rotating equipment required for main drive is 400 cycle alternator, constant potential exciter and voltage reference exciter shown in the center of photo.

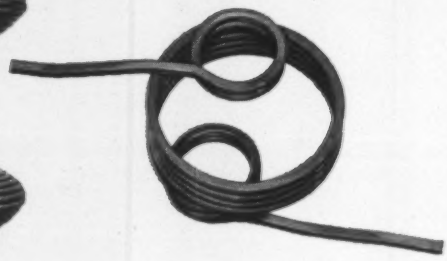
Westinghouse

Is yours plain or fancy? . . . . .



. . part or product?





It's hard to put a label on metal forms like these. That bellows-shaped assembly in the center, for instance, gets cut up into units that become flour sifters.

The point is—your design or specs are the result of careful planning. How they are produced—and who is best qualified to do it—should have the same careful consideration.

As these custom-produced parts show, A.S.C. Divisions have the ability—and agility—to meet complex or simple requirements. Try them.

For detailed information about who we are and what we make, write for "Pocket Guide to Springs and Other Things."

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new Continental Production Saw changes economics of cutoff sawing

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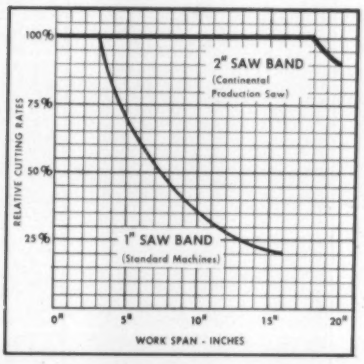

Two in. wide blade and machine design provides constant cutting rate to the capacity of the machine. The above chart shows the greater cutting rate of the 2" saw band over the 1" saw band.

Pays off on small work which can be ganged because cutting rate and accuracy are maintained as for a single piece.

The development of 2-in. wide saw bands simultaneously with the new Continental Production Saw has completely revolutionized the economics of cutoff sawing. The 2-in. saw bands have four times the beam strength of 1-in. band.

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- Overhead vises provide unobstructed work area
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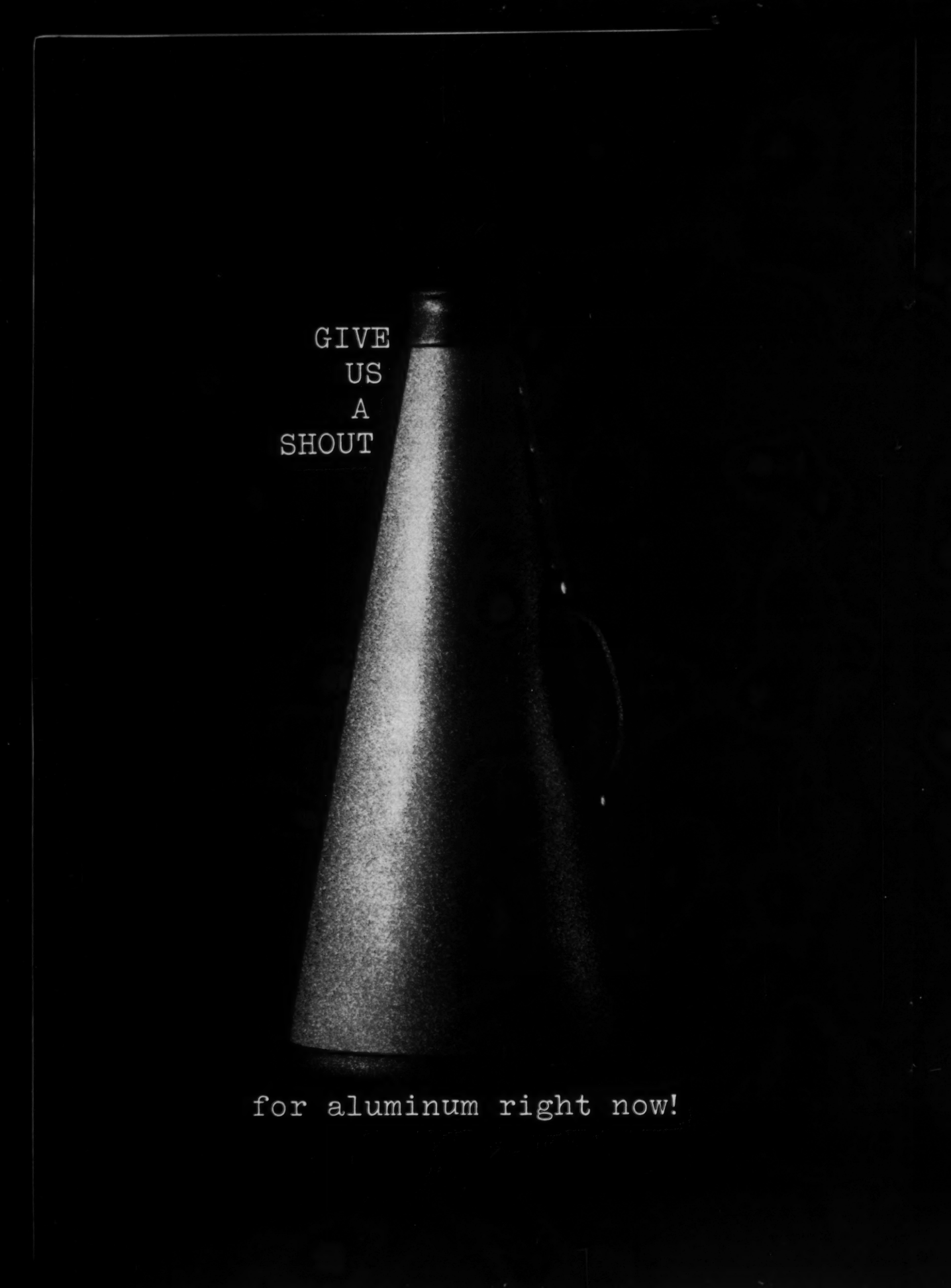

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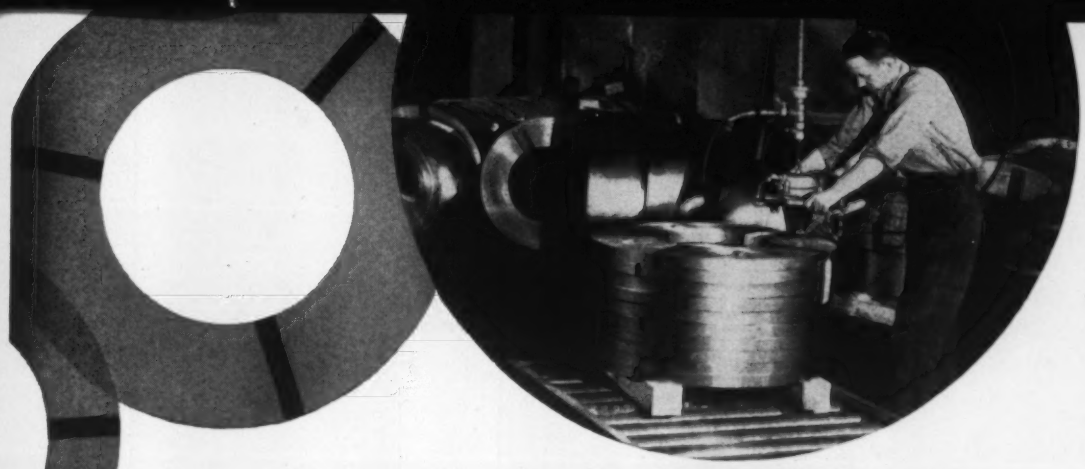

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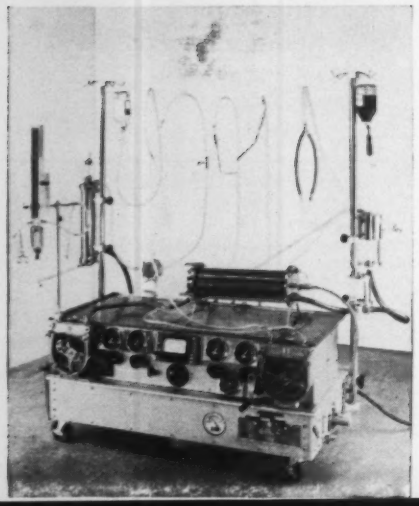

Heart surgery is always a matter of life and death.

The people who perform these operations and the equipment they use must work flawlessly. When they open the heart, it stops supplying blood to the body. So, they use an artificial heart and lung machine that pumps out the blood, keeps it at body temperature, removes carbon dioxide, adds oxygen and then returns it to the patient. This machine must not fail!

The design, construction and materials of the artificial heart and lung machine are the very best man can devise. Pemco, Inc. uses USS National Seamless Steel Tubing (Type 304 Stainless) for pump fittings, blood handling connectors and vessels.

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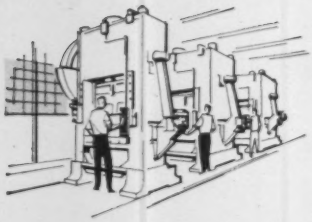

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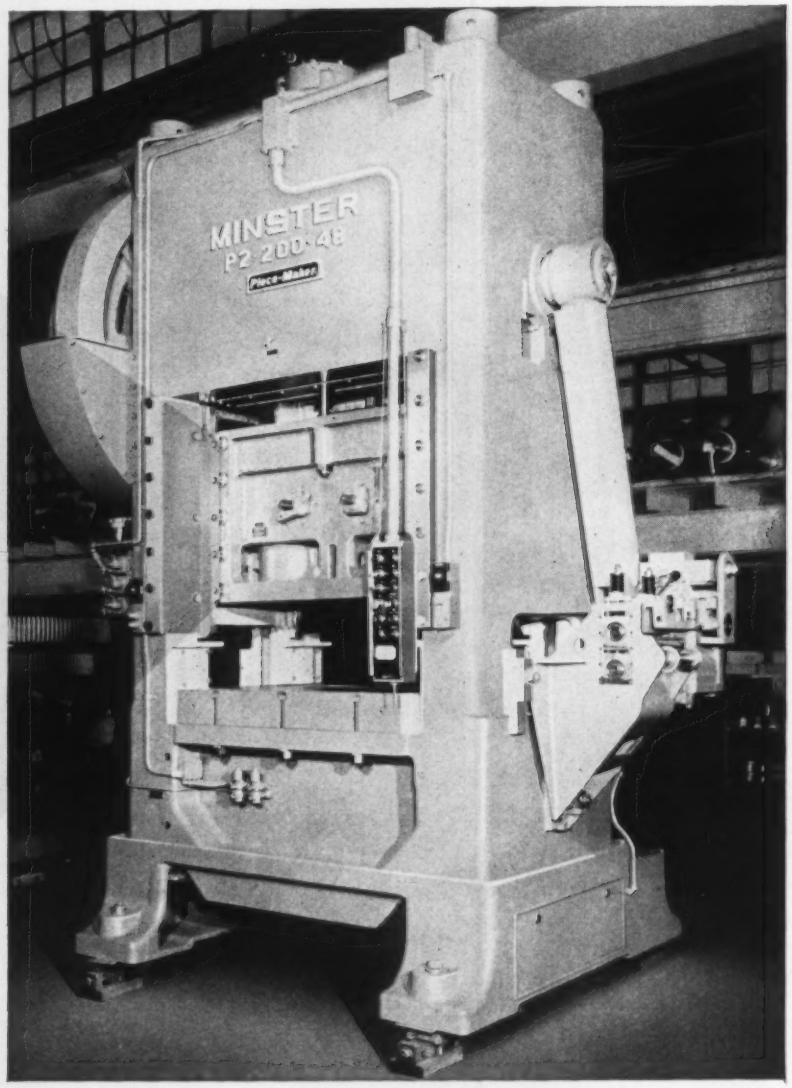

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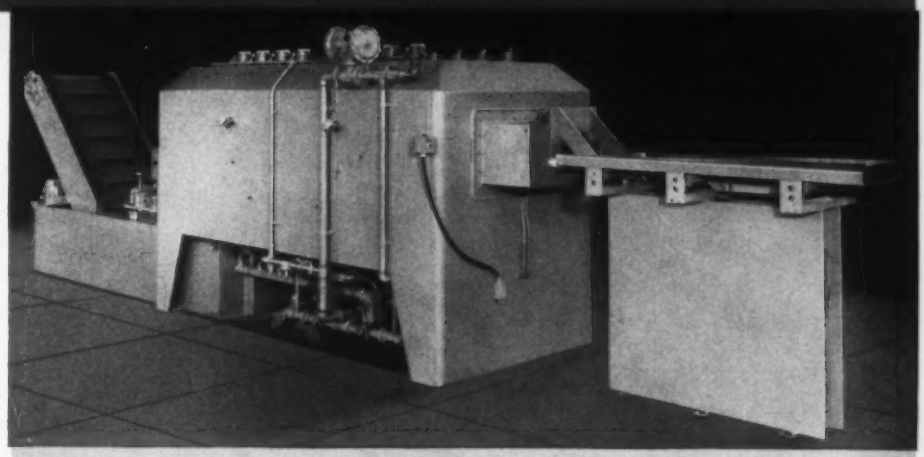
Lamina-Bronze Wear Plates and their use are more completely described in Bulletin WP-59, send for your free copy.

The adjustable slide ways of this Minster press utilize Lamina-Bronze (electroplated bronze on steel) Wear Plates to assure long-life and free-running. In like manner, Lamina-Bronze wear surfaces are the best answer for any part that requires the non-seizing properties of bronze and the strength of steel.

new Ipsen shaker-hearth furnace with

100% forced convection heating



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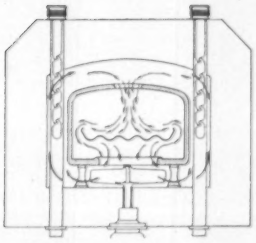

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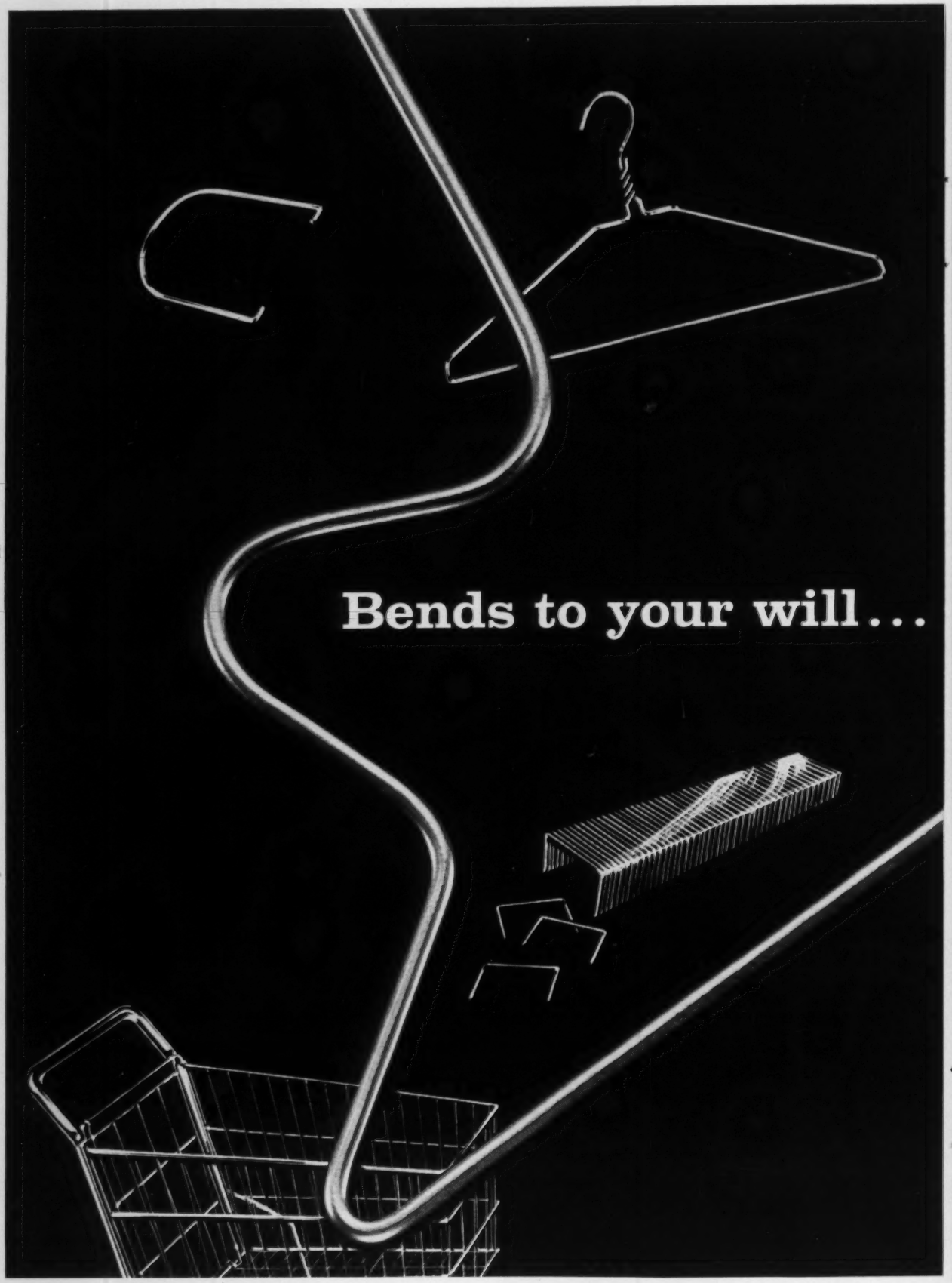
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If you want wire that forms easily or if you have a wire-forming problem, CF&I low carbon manufacturers wire can provide the answer. For example, this wire has the **ductility** that means more efficient fabrication on multiple slide machines . . . the **easy weldability** that speeds production and boosts end-product quality. It's available in sizes ranging from .500 inch to .0348 inch*, in both low carbon and medium carbon steel, and in a variety of finishes and tempers. Here are some typical examples of manufacturers wire produced by CF&I:

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- Basket Handle Wire
- Box Binding Wire
- Brush Handle Wire
- "Cal-Tie" Wire
- Can Key Wire
- Chain Wire
- Clamp Wire
- Clothes Pin Wire
- Cold Rolling Quality Wire
- Concrete Wire Accessories
- Garment Hanger Wire
- Hay Baling Wire (Coiled)
- Heading or Forging Quality Wire
- Industrial Quality Wire
- Medium High Carbon Wire
- Merchant Quality Wire
- Pail Bail Wire
- Rivet Wire
- Roll Threading Quality Wire
- Stapling Wire
- Strand Wire
- Tying Wire
- Welding Wire
- Wissco Iron Wire

CF&I engineers will be happy to consult with you concerning your wire-forming problems and recommend exactly the type, grade and finish of wire that's best for your operation.

In addition, CF&I Wire is "packaged for your production" in special packages to increase the efficiency and economy of your operation. For complete details and prompt service, contact your nearby CF&I sales office today. 8498

*Available in the West in size ranges from .625 to .0348

Steel means strength, beauty, economy.

The Colorado Fuel and Iron Corporation
Denver · Oakland · New York
Sales Offices in Key Cities

CF&I STEEL MADE IN U.S.A.

An automatic coiler forms .063 Johnson tinned music spring wire into an automobile brake cylinder spring. Because this spring will spend its life in a bath of corrosive brake fluid it needs a heavy, uniform tin plating that will not peel, crack or flake. It is a critical spring with 12½ coils, held to tight tolerances and coiled with two different end sizes. The larger end is 1.034 inches while the smaller end is .710 inch.

Mid-Continent Spring Company of Ky. says . . .

Dependable Johnson Music Spring Wire Gives Precision Springs Reliability

Dependable quality and quick service are two major reasons Johnson wire is specified in Kentucky spring plant

"After 23 years in the spring manufacturing business, I'll give you my one-word description of Johnson Steel & Wire Company's spring wire . . .

"It's DEPENDABLE."

So says L. B. Langhi, president of Mid-Continent Spring Company of Ky.

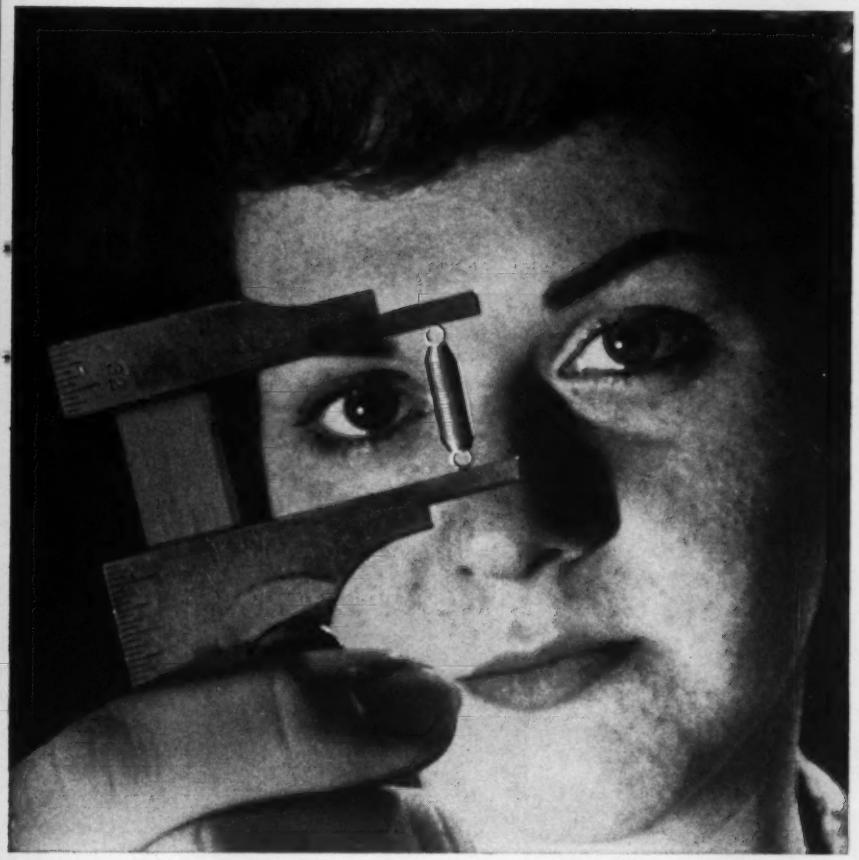
And that goes for Johnson's high carbon wire destined for springs that snap into action at the critical moment of a missile launching or simply make a baby doll wink, as Mr. Langhi explains.

Regardless of their job, it's vitally important to Mid-Continent's customers that springs function with precision. So the firm's plant at Hopkinsville, Ky., builds reliability into all its products, whether for space flights, toys, automotive and electrical parts or vending machines.

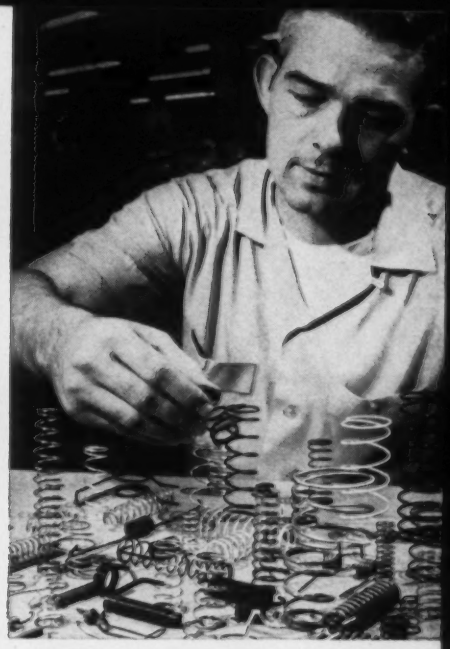
This reliability depends as much upon the raw materials of the springs —music spring wire or oil tempered spring wire—as it does upon the skills of Mid-Continent's spring makers.

Mr. Langhi said: "Because our customers depend upon our springs to give them a full measure of value, we demand and get wire from Johnson that has a uniform quality in finish, temper, size and physical properties.

"Coatings on Johnson tin-coated



A carburetor control extension spring must be held to unvarying tolerances to insure consistent performance. This important spring is made of Johnson .010 tinned music spring wire, has an O.D. of .118 inch and measures ¾ inch outside the loops.



R. M. Worthman, purchasing agent for Mid-Continent Spring examines some of the one thousand different type springs manufactured at Mid-Continent.

This tiny vending machine extension spring is made of Johnson .013 tinned music spring wire, has .158 I.D. and 22 turns.

music spring wire are both uniform and adherent. This eliminates peeling, cracking or flaking during our coiling operation."

High physical properties, uniform cast and smooth surfaces are other important requirements since Mid-Continent springs must form within strict dimensions and carry precise work loads.

At Mid-Continent, accuracy of wire dimensions greatly affects spring coiling and performance. Close tolerances on dimensions are met consistently in fine wire specialties produced by Johnson Steel & Wire Company.

"Our production averages over a million springs per day," said R. M. Worthman, purchasing agent for Mid-Continent Spring.

"Because of this, we keep our warehouse stocked with at least 300 tons of wire. Johnson supplies us with a range of .008-inch to .207-inch music spring wire and oil tempered wire.

"Whenever our wire stock begins to deplete, we're able to call for and get fast delivery service from Johnson's mill in Worcester or from its warehouses in Chicago or Akron.

"Of the 64 different types of brake drum springs we manufacture, 90 percent of them are made of Johnson wire. That's what we think of Johnson Steel's wire."

Let Johnson start today to help you with your high carbon spring wire needs.

Just call the nearest district sales office and talk with a Johnson representative. He's ready to help you with whatever your wire and spring problems might be—right now.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

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Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

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Keep your steel operations flexible by removing all uncertainties about oxygen supply with an Airco tonnage oxygen plant. A plant we build and operate for you — on or adjacent to your site — gives you assurance of supply that only an experienced oxygen producer like Airco can guarantee.

GUARANTEED BACK-UP. Your oxygen plant is backed up by Airco's nationwide network of oxygen plants. If the plant is down for any reason, Airco will keep your oxygen flowing from its integrated system. If you need more oxygen than originally anticipated, Airco will supply whatever quantities you require. And you won't be boxed in with a rigid purchase arrangement that can't be adjusted to steel production.

PROVEN TECHNOLOGY. Making oxygen — like making steel — is a specialized business. Airco has 45 years'

let Airco build and operate a plant for you

experience in low-temperature technology . . . design, engineering and construction proficiency that has dotted the country with oxygen plants — including the first on-site oxygen plant for steel. There's no first-plant guesswork . . . late starts . . . long debugging periods that ruin your production schedules.

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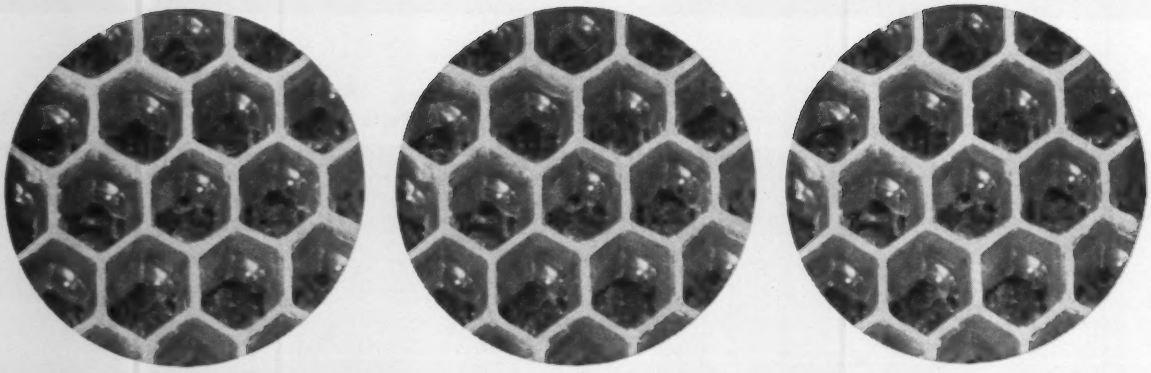


POSITIVE DUPLICATION—EVERY TIME!

One of nature's enduring, dependable marvels is the structure of honeycombs—formed exactly the same way time after time after time. This is Positive Duplication—yours also with these CINCINNATI CENTER-TYPE GRINDING WHEELS, and with *all* CINCINNATI (PD)° WHEELS.

HOW "PD" IS ACHIEVED

To produce grinding wheels of unsurpassed uniformity, Cincinnati developed its unique (PD) manufacturing process, involving 36 quality controls. These rigid controls govern every step of wheel production. They achieve, for example, tolerance for wheel inside diameters which are the "tightest" in the industry. So your CINCINNATI WHEELS have better balance, require less dressing and last longer.

HOW "PD" PAYS OFF FOR YOU

The uniformity and longer wheel life you get permits you to plan production schedules with the assurance that each reorder wheel will act and grind exactly like the original. This is the promise—and *performance*—of Positive Duplication.

CUT COSTS . . . CALL CINCINNATI NOW

You can solve your grinding problems with the help of specialists trained by the Cincinnati Milling Machine Co. Their wide experience in job set-ups and grinding operations is at your service. Just call your CINCINNATI GRINDING WHEELS Distributor or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI°
GRINDING WHEELS

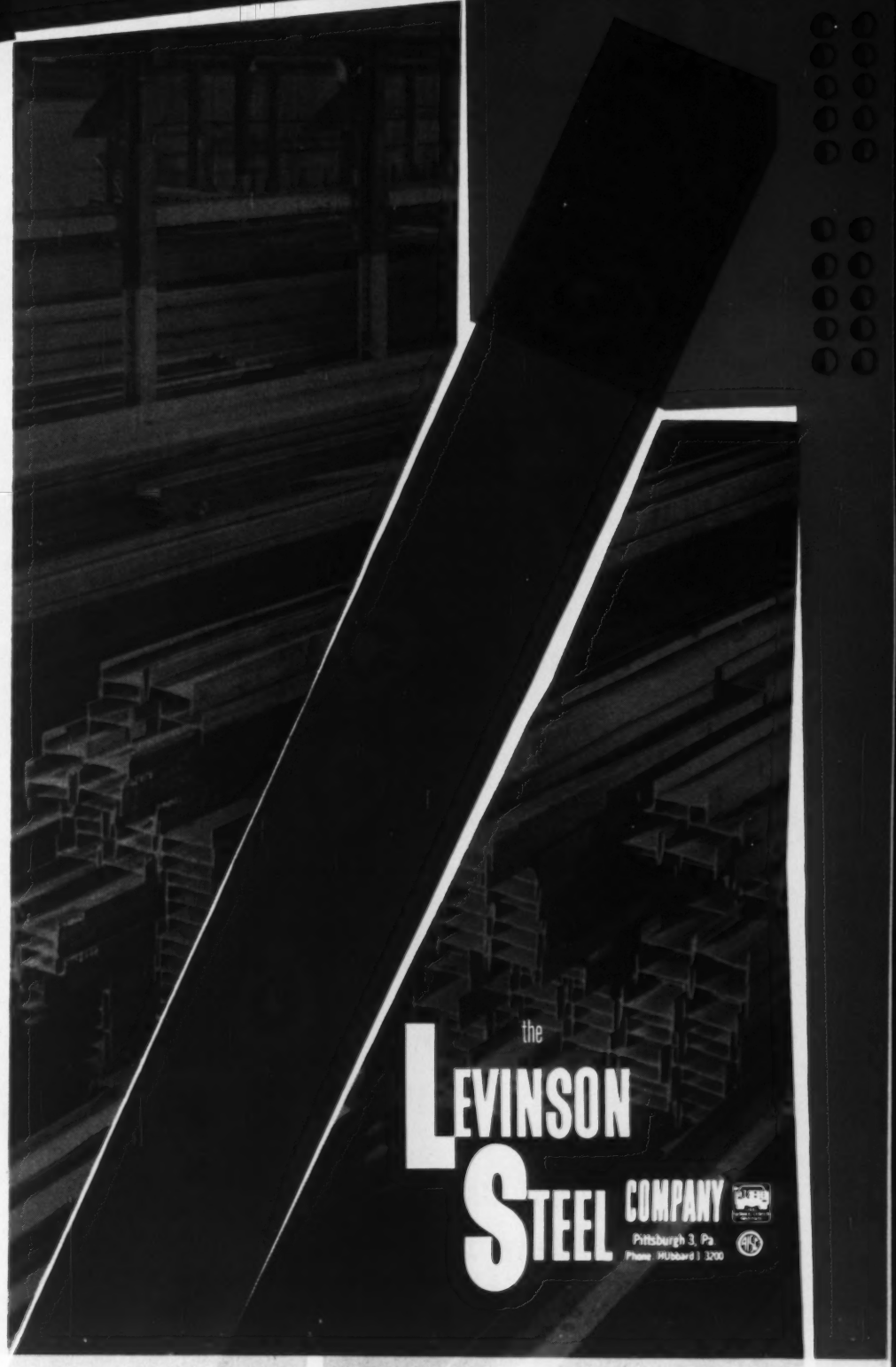
°Trade Mark Reg. U.S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

A mile of stockpile

When you need steel fast, whether it's a few 1″ bars for a rush maintenance requirement or several hundred tons of highly fabricated structural steel—Levinson saves you precious hours or weeks by drawing from its large, comprehensive stockpile. For either plain or fabricated steel, Levinson will fill your order as specified and on time. Yes, when you leave it to Levinson, you leave it to experience!

Designers, Fabricators, Warehousers, Erectors
For Over 50 Years.



the
LEVINSON
STEEL COMPANY
Pittsburgh 3, Pa.
Phone: HUbbard 1-3200

9:02

Motor stopped; disassembly begun.

9:20

Sufficiently disassembled
to permit bearing inspection.

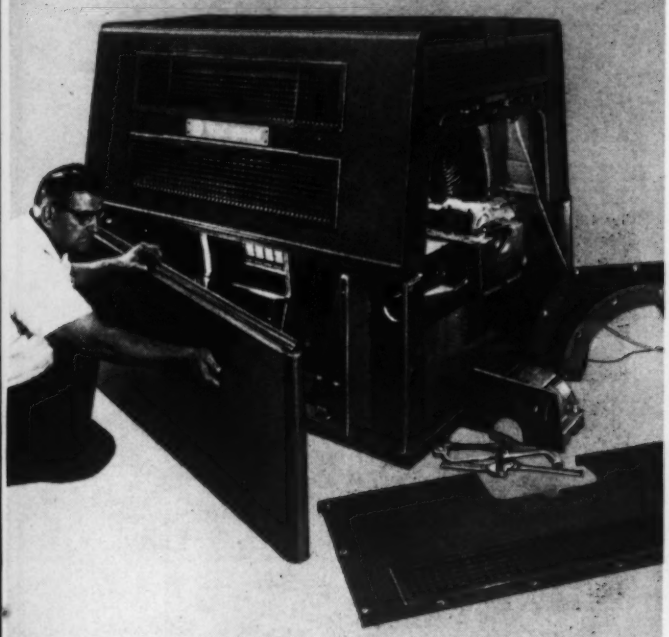
Westinghouse F/A motor completely disassembled in 90 minutes

"F/A" means "Fully Accessible" . . . Only 90 minutes are required for a complete disassembly. After cleaning, inspecting and servicing, the F/A motor can be completely reassembled and put back in operation in about two hours.

No other motor can be serviced so quickly. One electric utility maintenance engineer estimates that

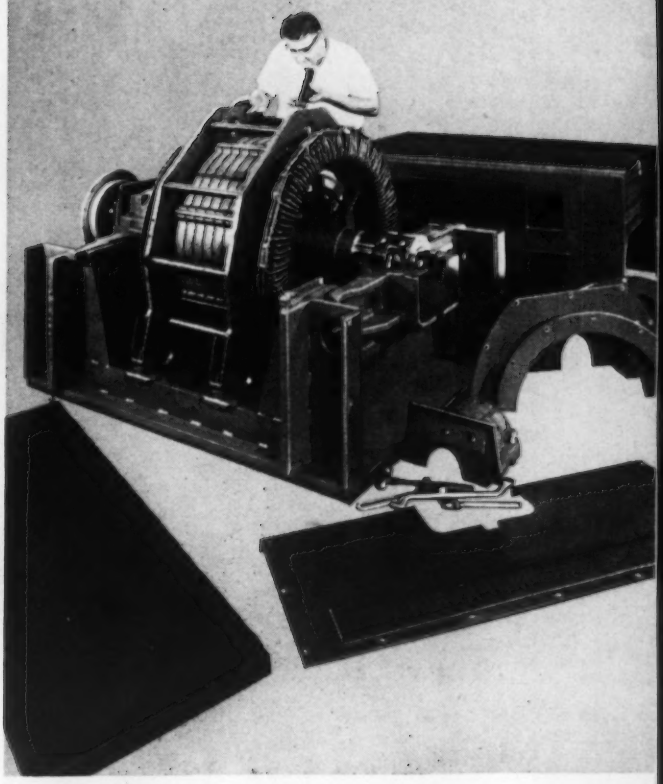
9:40

End covers, side panels, air shields removed. Winding inspection now possible.



10:32

Complete disassembly possible for major cleaning, inspection and servicing.



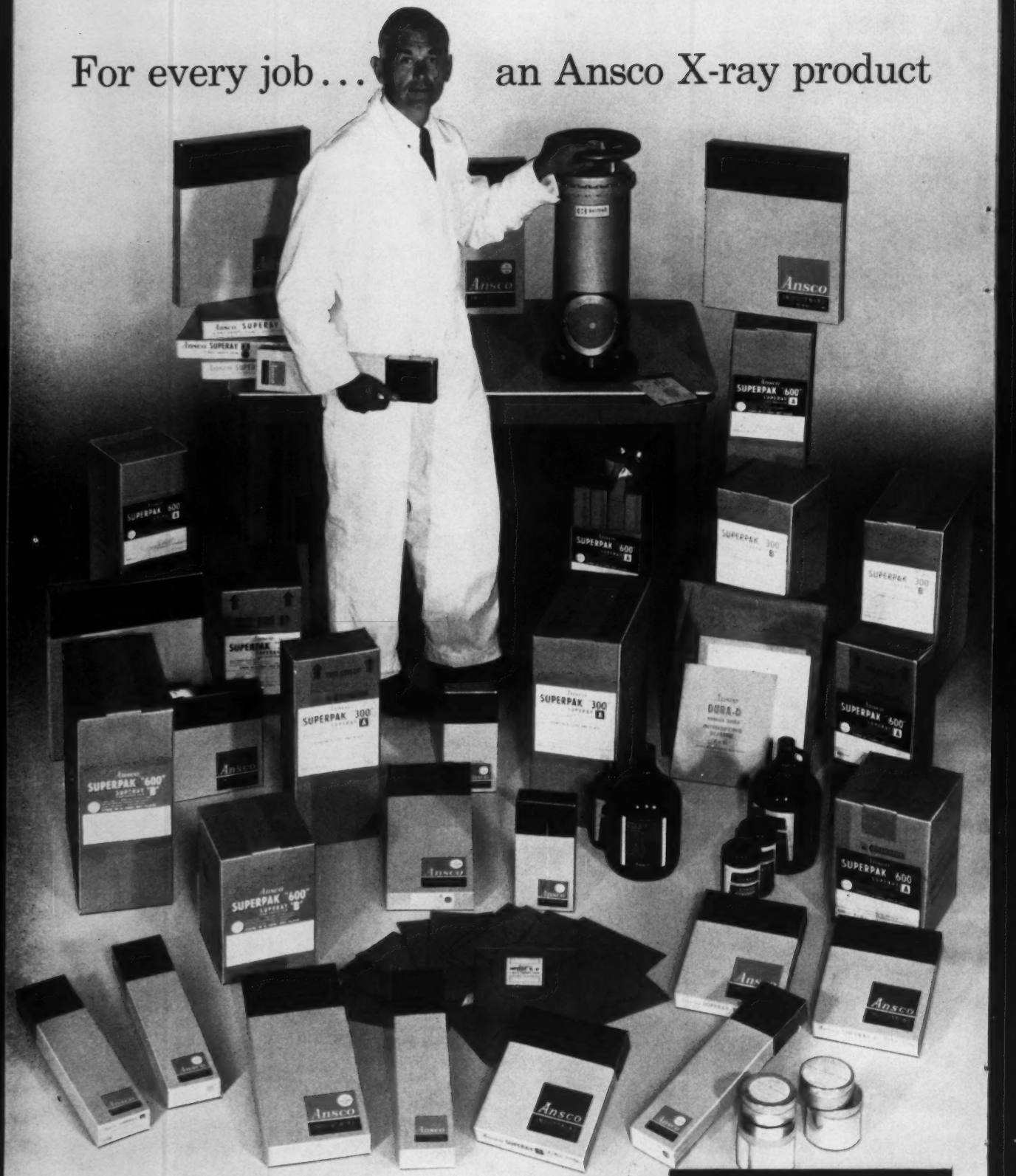
a Westinghouse F/A motor can be serviced in about one-fourth the normal time.

F/A motors are available in ratings from 250 hp/600 rpm to 7,000 hp/3600 rpm. For more information, call your Westinghouse Representative. Or, write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. *You can be sure . . . if it's*

Westinghouse

J-15022

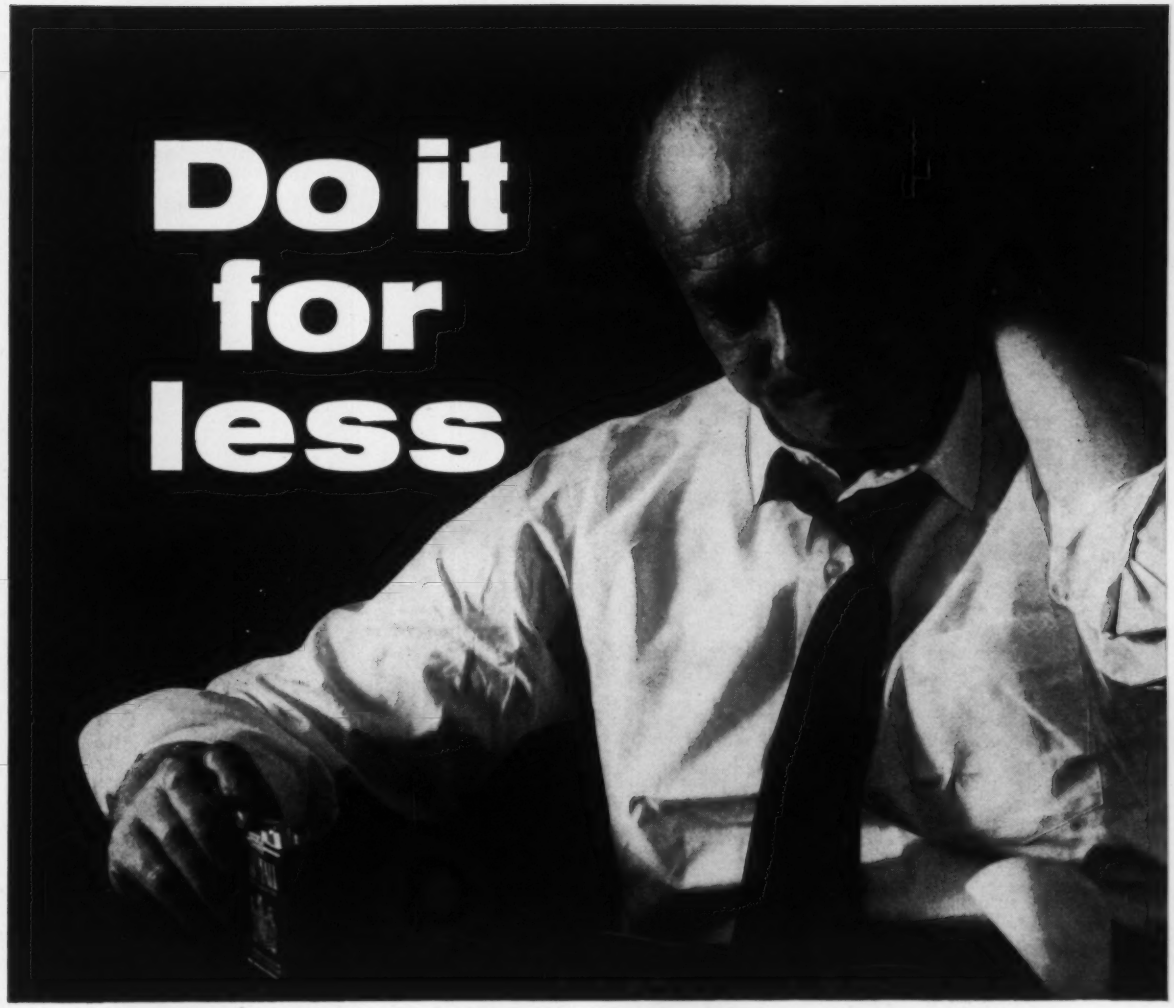
For every job . . . an Ansco X-ray product



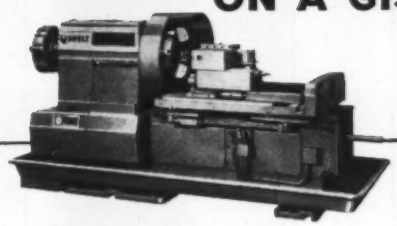
Varied film emulsions for maximum penetrometer sensitivity . . .
Versatile packages that take the work out of film handling . . .
Your Ansco representative is a trained X-ray specialist who will render quick service on a personal basis—Another example of the extra service you get when you buy Ansco. *Ansco, Binghamton, N. Y., A Division of General Aniline & Film Corp.*

Ansco

Industrial X-ray



ON A GISHOLT SIMPLIMATIC



Gisholt MASTERLINE Simplimatic Automatic Chucking Lathe

—The essence of the building block principle—

—Standard headstock and bed . . . a wide screw-fed platen

—Standard front, center, rear or auxiliary slides with tool blocks

—Positioned to machine a maximum number of surfaces per chucking

—Accessories include JETracer Slides—attachments for simultaneous front and back machining.

Ask your Gisholt Representative or write for Catalog 1159-C.

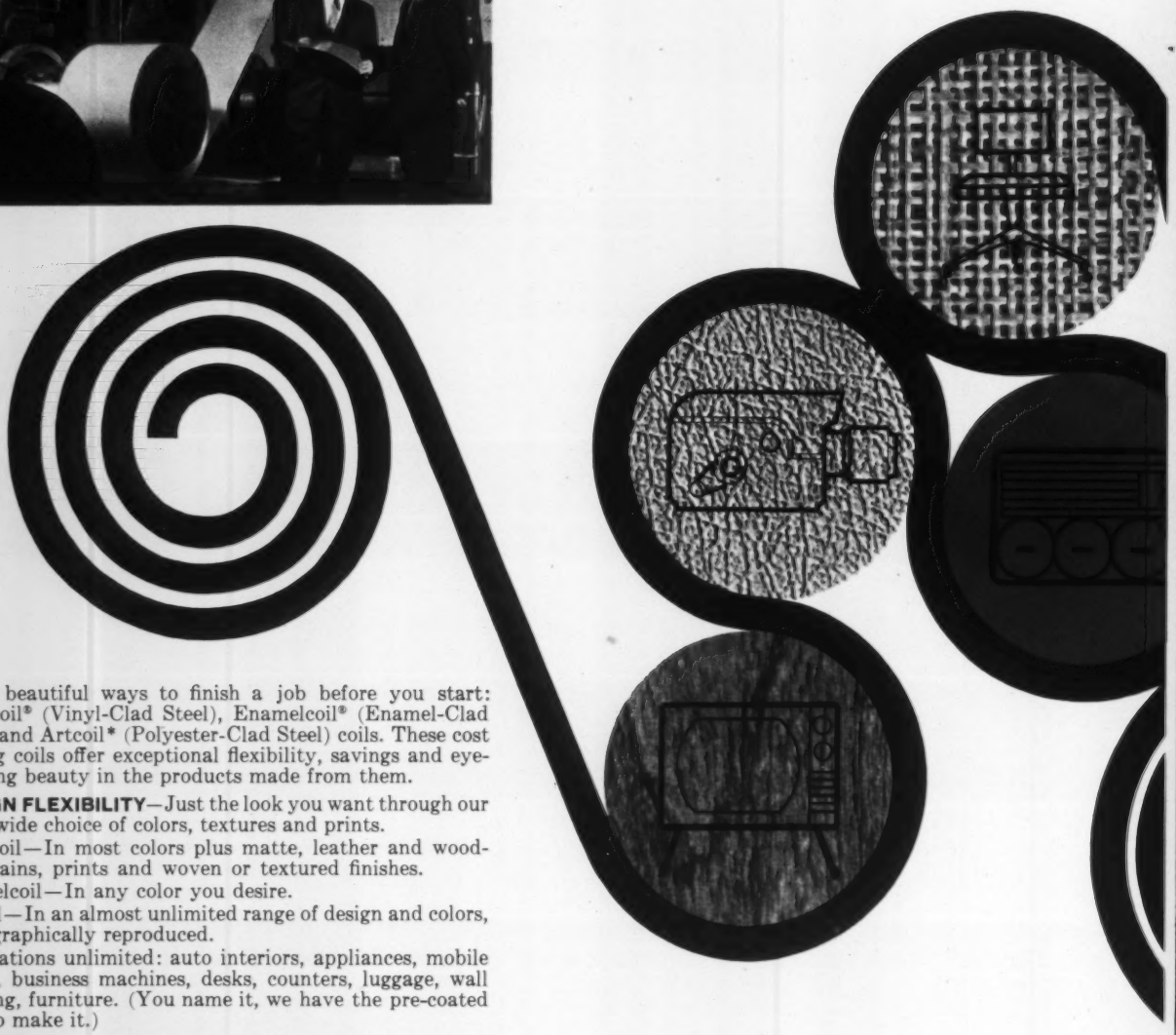
If you think in terms of "specials" to machine rings, discs, flywheels, sheaves, bevel gears, motor frames or complex housings, it will pay you to investigate the Gisholt Simplimatic. You can save money and precious lead time with the flexibility offered by this *standard* automatic lathe.

Standard "building block" tooling elements provide an infinite variety of arrangements to combine operations, reduce handling, improve quality, and cut floor-to-floor times to a minimum. Many so-called "special" jobs are now being done on the *standard* Gisholt Simplimatic. We invite you to compare the results. You'll find that you, too, can do it for less!

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

A BEAUTIFUL FINISH TO START WITH ... AND SAVE WITH:

PRE-COATED STEEL COILS FROM ENAMELSTRIP



Three beautiful ways to finish a job before you start: Vinylcoil® (Vinyl-Clad Steel), Enamelcoil® (Enamel-Clad Steel) and Artcoil* (Polyester-Clad Steel) coils. These cost cutting coils offer exceptional flexibility, savings and eye-catching beauty in the products made from them.

DESIGN FLEXIBILITY—Just the look you want through our wide, wide choice of colors, textures and prints.

Vinylcoil—In most colors plus matte, leather and wood-like grains, prints and woven or textured finishes.

Enamelcoil—In any color you desire.

Artcoil—In an almost unlimited range of design and colors, photographically reproduced.

Applications unlimited: auto interiors, appliances, mobile homes, business machines, desks, counters, luggage, wall paneling, furniture. (You name it, we have the pre-coated steel to make it.)

PRODUCTION SAVINGS—No cleaning, tumbling, spraying, dipping, rustproofing, baking or drying. Less scrap loss; reduced investment in finishing equipment, space and labor requirements; lower insurance costs; longer die life. No fabricating restrictions—you can bend, crimp, drill, pierce, emboss, deep draw, roll form or lock seam most finishes—work them to the very limits of their tough steel base without damaging their durable coatings.

SALES APPEAL—Your product has immediate customer appeal because of its finished beauty, its resistance to scratches, scuff marks, stains and corrosion.

The competitive edge is yours when you start with a beautiful finish. Specify the good looks and long life—the savings and flexibility of these modern pre-coated steel coils from Enamelstrip. Contact your nearest National Steel Sales Office for complete details.

*Trademark

ENAMELSTRIP ALLENTOWN PENNSYLVANIA

ENAMELSTRIP IS A DIVISION OF **NATIONAL STEEL CORPORATION**

Spaulding **FIBRE FACTS FOR ENGINEERS** NUMBER 4

How to Punch Vulcanized Fibre to Reduce Fabrication Costs

by K. H. Alverson, Product Standards Director

Vulcanized Fibre's capacity for easy punching makes this material highly attractive to the designer whose application calls for characteristics such as good dielectric strength, light weight, rugged strength, irregular contours and holes and indentations in the surface of a part.

Punching is done with two kinds of precision: Rough punching uses the lowest cost solid dies, is rapid and economical, but leaves a fractured raw edge and is limited to stock thicknesses through ¼ in.; smooth shaving uses a contour die ground to a sharp edge that slopes away at 45°. The edge shaves stock when the part is forced into the die producing smooth edges in parts up to 1 in. thick. Holes can be punched easily, but should be generally spaced from each other and from any edge by at least the thickness of the stock. Noncircular holes and counterbores should be made circular for machining when the stock thickness specified is too thick to punch.

For thickness under 3/64", vulcanized fibre can be punched most economically with steel rule dies. Dies for simple parts usually cost much less than solid dies even for irregular contours. Tooling for scoring or creasing can also be added with little additional cost.

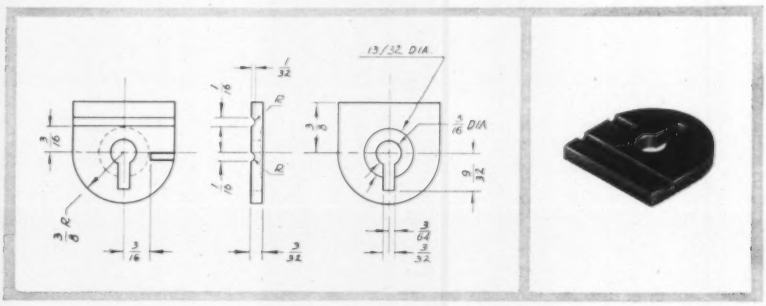
Most parts can be punched without additional conditioning if the vulcanized fibre has its normal moisture content of 5½ to 7%. For especially difficult punchings, or for parts thicker than ⅛", heating up to 200°F may be desirable.

Additional economies may be obtained in thicknesses 1/16" and under by using coils slit from parent rolls, reducing waste of stock, speeding up the punching operation, and reducing inspection costs.

Many extras may be incorporated in punching operations on vulcanized fibre. These include scoring or creasing for subsequent forming along established lines. Also practical are swaging or forming into special shapes, such as shoulder bushings or angles.

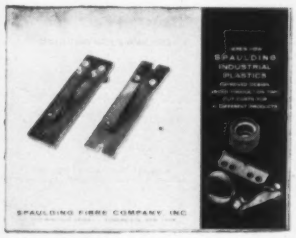
Stamping letters and numerals into the surface of vulcanized fibre in the punch-press operation produces permanently legible markings with no increase in cost of the part. White or colored roll leaf characters can also be impressed into the surface to give color contrast at very little added cost. Punched parts are also readily printed with rubber stamp.

Spaulding Engineers who have been trained in Value Analysis can help you take advantage of the wide range of possibilities in designing to reduce costs through the use of vulcanized fibre parts. They also make available to you Spaulding's extensive fabricating facilities and experience in working with this extraordinary material.



The fabrication of this shut-off switch insulator demonstrates vulcanized fibre's facility for punching and swaging. Previously moulded out of nylon, the part is now made by swaging both sides and punching vulcanized fibre — all in the same operation and at lower costs both for material and processing.

Send for your FREE copies of this literature



Value Analysis Brochure — case histories of design improvement and cost reductions that have been accomplished through Spaulding's value analysis of customer products.

Vulcanized Fibre Engineering Data — a design reference book which comprehensively covers all the application specs of vulcanized fibre.

SPAULDING FIBRE COMPANY, INC.

348 Wheeler Street · Tonawanda, New York

STEELMAKING AT JESSOP

Survival? It could depend on a 3,000-mile picket fence

Ever-vigilant sentinels against surprise attack are the radar installations along the DEW Line. Stretching 3,000 miles across Canada and Alaska, this electronic fence is our first line of defense.

At bleak, lonely outposts Air Force and civilian technicians watch for tell-tale blips on radarscopes—Distant Early Warning of the possible approach of enemy aircraft or missiles.

This all-weather system must withstand the worst of the elements—sub-zero temperatures, high velocity winds, rain, snow and ice storms common to the Far North. And dependability of the equipment could determine whether or not we survive an attack.

There are numerous applications for specialty steels made by Jessop Steel Company in DEW Line installations. For example, forging quality alloys and wear-resistant tool steels for the gear mechanism of a rotating surveillance radar; cast-to-shape steel for certain other component parts and precision ground steels for delicate instrumentation.

Jessop is keenly aware of the importance of built-in dependability in the steelmaking process—whether meeting specifications for steel to be used in the nuclear reactor of a Polaris-firing submarine; a Redstone missile to launch an astronaut; an earth-girdling satellite; or a DEW Line radar installation.

Yes, for dependability, you can rely on Jessop . . . the *big* name in specialty steel.

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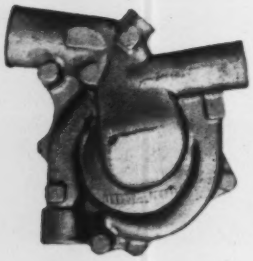
JESSOP

lower production costs with Decatur quality castings

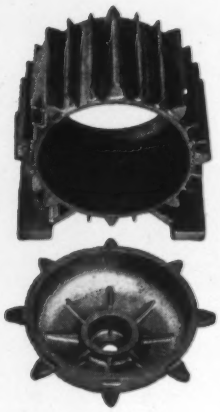


In the highly competitive field of gray iron castings, buyers constantly seek greater reliability at lower cost. They lower costs by using castings which require minimum finishing and have the lowest rejection rate.

Decatur Quality Castings® have exceptionally smooth surface finish comparable to shell or permanent mold castings. When required, precisely controlled heat treating in our furnace gives these castings the uniform metallurgical properties necessary for high production machining. Preparation of unmachined areas is usually unnecessary.

Decatur castings are shipped to your plant in our trucks when quantities permit to insure prompt service.

We are light gray iron and alloyed iron specialists supplying castings weighing a few ounces to 100 pounds.



THE DECATUR CASTING CO.

Decatur Quality Castings® Light Gray Iron and Alloyed Iron Specialists
Decatur, Indiana • Phone: Decatur 3-2700

Think Quality...

THE CONSISTENT QUALITY OF HOLO-KROME THERMO-FORGED SOCKET SCREWS CUTS REJECT AND IN-WARRANTY SERVICE COSTS*

Are inspection, in-warranty and replacement costs putting a tight squeeze on your profits? Join other profit-conscious industrial leaders in turning to *quality* to reduce these costs and increase profits. THERMO-FORGED socket screws are produced by a patented electronic forging process which pre-conditions the metal. This makes possible exact control of metal flow, and allows us to maintain tolerances impossible with other forging methods. Thread rolling and subsequent operations are controlled more precisely than ever. As a result, THERMO-FORGED socket screws are unmatched in quality, free from flaws, checks and hidden imperfections, with dimensional precision unattainable with ordinary forging methods. THERMO-FORGED socket screws can materially increase your profits by reducing rejects and in-warranty service costs. See your authorized Holo-Krome distributor or write for more information.

**Trade Mark of The Holo-Krome Screw Corporation*

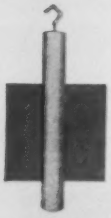
HOLO-KROME
Thermo-Forged*
SOCKET SCREWS

SOLD ONLY THROUGH AUTHORIZED HOLO-KROME DISTRIBUTORS
THE HOLO-KROME SCREW CORPORATION • HARTFORD 10, CONN.

. . . and all others who require quality rods and bars !

There's no substitute in the exacting Fastener Trade for "know-how". Seaway personnel is thoroughly familiar through years of experience with the needs of the Fastener and Forging trades...and this "know-how" extends from the front office right straight through the plant and rolling mill. The broad fastener experience of our staff is at your disposal.

SPECIAL ANALYSIS ● *SPECIAL SURFACE FINISHES*
SPECIAL HARDNESS ● *SPECIAL HEAT TREATING*
QUALITY-FORGING AND COLD HEADING



New INDEPENDENT SOURCE
For ROLLED NICKEL ANODES
SEAWAY NICKEL DIVISION
North Tonawanda, New York

Steel

SEAWAY STEEL DIVISION
ROBLIN-SEAWAY INDUSTRIES, INC.
NORTH TONAWANDA, NEW YORK • TELEPHONE AREA CODE 716 — NX 3-9700

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A FASTER WRITE-OFF FOR MACHINERY used in the textile field has been allowed by the government. The move, sparked by the White House, will reduce write-off periods to 15 years or less, down from 25-year periods before. New write-offs are based on revised government "useful life" schedules. The Treasury is now taking a look at schedules in other lines.

RAIL CAR ORDERS WILL JUMP next year to 50,000 cars, up from 20,000 new car orders placed this year. This is the prediction of J. B. Lanterman, president of American Steel Foundries Corp. Orders are expected to hit all at once and could affect deliveries of structural and wide plate to other customers.

FALLOUT SHELTERS REMAIN A HOT ITEM with buiders. The National Assn. of Home Builders reports an average 250 requests per week from builders asking for construction details and costs.

U. S. MANUFACTURERS NEED WORLD MARKETS, says Hickman Price, Jr., assistant Secretary of Commerce. But he says many present U. S. trade methods have been "found wanting." Two points he stresses: U. S. companies must learn to "think in terms of exports." And "management must be sold on value of proper advertising and promotion abroad."

TWO BILLION CONTAINERS are expected to be used by 1965 for fresh and frozen baked goods. The forecast is made by J. R. Kitchen, product manager for foil containers for Kaiser Aluminunm & Chemical Sales Corp. Usage in 1960 was 1.2 billion units.

U. S. MACHINE TOOL MAKERS are getting more and more orders from overseas under foreign aid programs. Even U. S. funds released through the United Nations and Export-Import Bank programs are being used to buy tools in this country. This is due to discreet behind-the-scenes diplomacy by the U. S. government.

A STRONG TREND TO NEW AND EXTENDED WARRANTIES is noted in a study just completed by industrial designers Lippincott & Margulies. Consumer warranties in most cases have doubled or tripled in time coverage. Manufacturers' reasons for the trend: To build consumer confidence, get competitive edge, fight foreign sources, keep up with product improvements, back up quality claims.

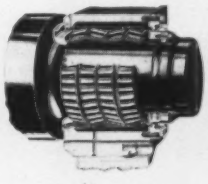
Lower operating costs on hot strip mill with modern Timken® back-up roll bearings

When this 56-inch semi-continuous hot strip mill was built, the operator wanted to be sure it would roll silicon, high alloy, carbon and stainless steels at the lowest possible operating cost per ton. They made sure by mounting back-up rolls on modern Timken® tapered roller bearings. Operating cost savings have been proved by acutal case studies on hot strip mills in the steel industry.

Timken bearings use low-cost lubrication and they eliminate costly mill downtime due to damaged bearings and failure of the lubrication system. Because they virtually eliminate friction, mills start up easier, bearings and rolls last longer.

Modern Timken balanced proportioned bearings in back-up roll positions on new mills are being designed to provide: 1) 10% roll turn down, 2) Roll neck diameters which are 70% of the minimum roll barrel diameter, 3) Normal roll neck stresses of 8,500 pounds per square inch. For the most in bearing performance and engineering service when you buy or build a mill, specify Timken bearings.

The Timken Roller Bearing Company, Canton 6, Ohio. Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.



Industry rolls on

TIMKEN®

tapered roller bearings

Tough Labor Policies on Trial As NLRB Reviews GE Tactics

GE case points up a possible clash between business and government on key labor points.

One issue is the concept of management's direct communication with workers on strike issues.

By G. J. McManus

■ Is new management thinking on labor matters headed for a clash with equally new government thinking in this field?

The lines have not been staked out clearly on either side, but opposing trends are strongly indicated.

On the one hand, companies are talking about a more determined, less inhibited approach to labor relations. On the other side, the administration is seen veering toward tighter restriction of management in employee dealings.

Reflected in Rulings — Conflict on broad economic matters was spelled out in the exchange between President Kennedy and steel executives on prices. Now, a new pattern of detailed labor administration is taking shape and the first outlines are not encouraging to industry.

Recent rulings by the National Labor Relations Board are taken to mean a definite shift toward a position more favorable to unions. Reversing a finding during the Eisenhower term, the present board has ordered General Motors Corp. to consider an agency shop proposal of United Autoworkers of America.

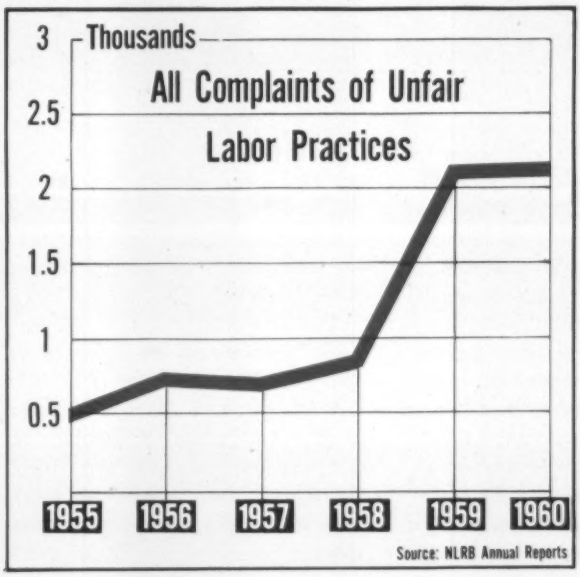
Recent decisions have tended to give unions greater leeway in the publicity aspects of secondary boycotts. New interpretations are seen strengthening a union's power to force discharges of non-members.

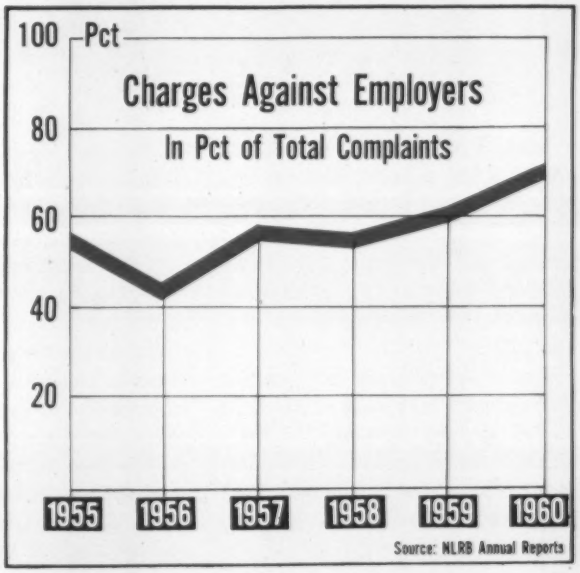
GE on Trial—The big test of new viewpoints may come in an NLRB case now being heard in New York. This involves General Electric Co. and the International Union of Electrical, Radio and Machine Workers (IUE—AFL-CIO). GE is charged with failure to bargain and with attempts to undermine the union.

The action stems from last year's contract talks, when the company resisted a strike and ultimately won acceptance of its proposals. A long list of IUE complaints centers on GE's unwillingness to make concessions and its program of employee communications.

GE Rebuttal—General Electric rejects all the union contentions. The company says it did modify its offer but that the law very specifically states you are not required to make changes, or even a proposal, in order to bargain in good faith. On the matter of communications with

Unfair Practices Charges Are Climbing





How Freely Can You Speak?

A recent congressional study of NLRB brought out various views on employee communications. Comments referred mainly to election situations.

1. Majority Report—"The subcommittee recommends that the Labor Board re-examine its . . . doctrine with one eye to adopting a policy of equal opportunity in presentation of issues. Should the employer choose to march his employees to a captive audience meeting, the union should be allowed equal time in discussing the issues."

2. Minority Report—There is a move to undermine the Taft Hartley Act. Changes proposed for NLRB would restrict or abolish "the employer's right to talk to his employees."

3. David J. McDonald, President United Steelworkers of America—". . . the old Board and the courts held that an employer who resorted to the captive audience was required to afford the union an equal opportunity." The Eisenhower Board reversed this in election situations, says Mr. McDonald.

4. National Association of Manufacturers—"We believe . . . freedom of speech is a right that should be accorded to everyone." Any changes "should be in the direction of strengthening, rather than weakening the protection of free speech."

Source: Report of the Subcommittee on NLRB of the Committee on Education and Labor, Sept. 1961.

employees, GE says this is a question of free speech and that management's right to talk is further spelled out in the National Labor Relations Act.

The company appears confident its position will be sustained. It would be "fantastic" to compel horse trading in bargaining. New restrictions on communications are "unthinkable."

Nevertheless, GE notes this is the first time charges of this type have been granted a hearing. Similar moves by IUE were dismissed by the board twice before, says GE.

Tactics Spread—In speculating on NLRB's consideration of the charges now, General Electric points to a statement by a board counsel that its tactics "are being followed to a certain extent and sometimes to a large extent by other companies."

There seems to be no question management generally has been stirred to new thinking by GE's success and by economic pressures. Need for direct communications with employees is being stressed by steel mills and others.

"We of steel management believe we have an obligation to bring . . . views and facts to the attention of the employees of the companies and to the interested public, as well as to the union leaders," says R. Conrad Cooper, executive vice president, personnel services, United States Steel Corp.

"With or without union objection . . . American business management must proceed to redevelop its communications with its employees," says R. H. Lary, administrative vice president, labor relations, U. S. Steel.

Pro and Con—There is no indication in the steel industry or elsewhere that many people think it is possible, or desirable, to duplicate the full labor relations program of General Electric. A union official notes the auto negotiations have been marked by mildness and restraint on both sides. He could think of no industry where extreme views were gaining favor.

However, there could conceivably be problems in even a modified version of the GE approach. IUE charges include things like: Attacking union demands to employees and the public; holding meetings with employees to push acceptance of the company offer; advising employees on strike vote procedures.

It will be some time before the reaction of NLRB to these complaints is known. The present hearing is still in an early stage. A review by the full board is probably months away.

Politics Enters—GE is openly confident about the outcome. There is no possibility the union will be sustained, say two top labor lawyers, who have no love for NLRB. However, one informed source points to the political climate and says the board will uphold IUE.

A decision against GE could have some broad effect in restraining steel mills and others in coming negotiations. During the General Motors talks, UAW filed a charge with NLRB when the company refused to provide data on profit standards in support of an inflation argument. Steel talks could produce charges of refusal to bargain, improper communications, or withholding data.

But most authorities doubt that NLRB actions would amount to more than tactical moves in a major bargaining session. There is the practical difficulty that talks would probably be completed before a case could be tried. An order to cease and desist would have no great effect at this point. A congressional report deals with the matter of faster and more effective remedies but there has been no real move in this direction.

How Liberal?—Finally it is not yet established exactly how liberal the new board is. The General Counsel and three board members are holdovers from the Eisenhower Administration.

The new chairman is F. W. McCulloch, formerly an assistant to Sen. Paul Douglas.

While Mr. McCulloch is reluctant to give his general philosophy he did point out a decision in a recent "hot cargo" case might be considered as favoring the conservative view.

Are Pressures Due on Wages?

Unions May Also Get "Mail From the White House"

Evidence grows that the Administration's drive to stabilize prices may lead to wage level pressures.

But many in industry still believe the President will align himself with labor.
By R. W. Crosby

■ The Kennedy Administration appears to be recognizing that stable prices cannot be separated from wages. The President may be building a case against labor as well as management in his announced fight to stabilize prices.

KENNEDY: "Limit wage demands."

The evidence is growing. It has taken these forms:

When the President asked steel companies to bar price increases, he told steel executives; "If the industry were now to forego a price increase, it would enter collective bargaining with a record of 3½ years of price stability. It would clearly then be the turn of the labor representatives to limit wage demands to a level consistent with price stability."

Labor Side—In an exchange with United Steel Workers Union President David McDonald, Kennedy said the 1962 wage negotiations must end in a "settlement within the limits of advances in productivity and price stability."

Walter W. Heller, chairman of the President's Council of Economic Advisers has warned unions to "stay within the bounds of productivity increases" in their wage demands.

Most recently, Dr. James Tobin, a member of the Council of Economic Advisers, told a group of union economists that the President's appeal for wage and price restraint was not made just for the record. He said the President would do whatever necessary—appeal, exhort, plead—short of controls, to reach his objectives.

Critics—Kennedy critics—many of them in the steel industry—doubt the sincerity of these appeals. They believe the President will not deal equitably in the wage-price controversy. They believe the President will openly align himself with labor against industry.

The biggest question in this matter revolves around "productivity gains." Who determines productivity gains and how? The critics point out that statistics can do funny things to productivity gains.

In the past, the President has said that long-run productivity gains have been 2 pct annually per worker. Would this serve as a standard? It has been suggested that what is needed now is "a clear cut statement of the limit that productivity gains impose on wage increases."

It is also suggested that even with a case building against it, labor has nothing to fear from the new policies the Administration seems to be forming. The individual employee may be just as well off with a 2 pct wage increase and stable prices as with 4 pct, half of which is eaten away by inflation.

Why Steel—But some labor representatives don't like the sound of things. Dr. Tobin raised the ire of some of the union men to whom he spoke. Steel union men demanded to know why their segment of industry was being singled out. They were angry that eight months before contract bargaining was to begin, the government was putting pressure on the steel union. Dr. Tobin assured them no one union would be singled out.

But one school of thought in Washington believes labor faces a new threat. Congress is giving more and more attention to charges that unions are getting too big for their britches.

McDonald: "Why single out steel?"

Legislative action is expected on this question in Congress next session. Though passage of the legislation is very unlikely, President Kennedy's support for any of it could be a persuasive wedge against inflationary wage requests.

Legislators on both sides of the aisle favor more union controls.

Electronics: Beamed to Records

As Sales Rebound, Industry Talks of Record Year

Consumer orders for radios and color TV sets are pacing the sales recovery in the electronics industry.

With military and industrial markets strong, manufacturers believe sales next year may top 1961's high level.

By K. W. Bennett

■ The electronics industry, after a slow start, is expected to hit $10 billion in sales of manufactured goods this year.

When engineering, service, and other charges are added to the total tab, this perennial growth industry should register $20 billion in 1961 sales.

Electronics was a dark horse in the race for 1961 sales gains. When one of the barometers, receiving tube sales, was off from $325 million last year there were strong signs the industry would slacken off.

Summer Sales Rebound — But with a sales rebound over the summer months, electronics men are talking about a record year. They hope for capacity production during the fourth quarter in plants that had unused capacity four months ago.

Electronics is revising the reduced sales forecasts it made earlier this year. More important, it's producing some surprisingly strong profit figures; seems to be ready for stronger capital equipment outlay.

It's worth noting that, where some major electronic equipment producers report reduced profits, they point out the cutback is due to heavy investment outlays in the area of computer development. Four years ago it was color television which was eating up many corporations' profits. At the moment, color TV is at the payoff stage.

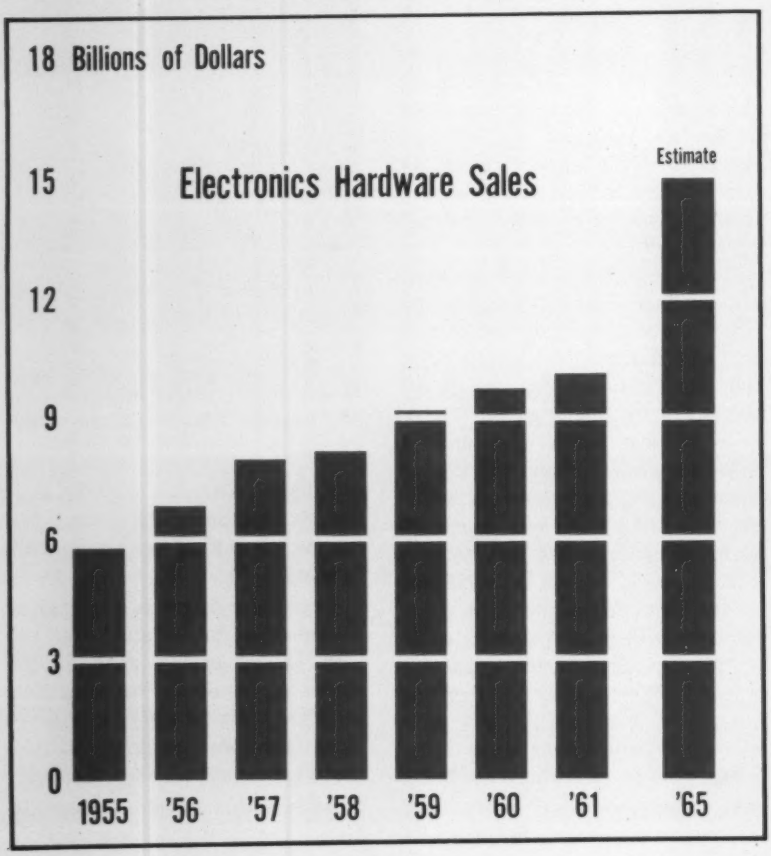
Consumer Comeback — One of the strongest—and most unexpected —areas of rebound is the consumer products market. Electronics sales were roughly divided this way in 1960: $5.3 billion for military electronic equipment; $1.9 billion in industrial electronic hardware; and $2 billion in consumer electronic equipment. A final $0.9 billion went into replacement parts. In the past two years, the strongest growth areas have been the industrial and military markets.

In 1961, however, consumer items are beginning to recapture some of the upward swing that followed the television explosion of the early 1950's.

Unexpected Demand — C. E. Lantz, president of Admiral Sales Corp., reports, "In the second half our sales and earnings will advance sharply over the second half of last year. On our large 27 in. black-and-white television set, we've had to allocate production due to unexpected demand."

Zenith Radio Corp. has been a pace setter in the consumer electronics field for two years. It's expecting a bigger 1961. Zenith has been producing at a rate of 5000 TV sets a day, and 6000 radio sets, plus other consumer items. Presi-

Sales Head for the Top in '61



dent J. S. Wright comments, "We have adjusted our schedules upward as far as possible, and we expect the remainder of the year to be very good." Zenith is rated the biggest television set producer in the U. S.

Record Sales — Radio Corporation of America process about $1.2 billion a year, over 50 pct in consumer products. Company president J. L. Burns reports that RCA's consumer electronic products have enjoyed their most profitable first half in the last decade. Profits reportedly hit a $1 million-plus figure in 1960, will advance again this year. The sales gross also hit records.

The advance in consumer electronic goods sales is important. It backstops advances in other, bigger, electronic markets. Electronics marketing men believe that Raytheon Corp., at $500-million plus a year, is the nation's top producer of defense - aimed electronic hardware. The company puts 85 pct of its output into defense work. Raytheon sales, advanced by $30 million through the first half, are expected to gain again in third quarter. The outlook is for further gains in 1962.

Hallicrafter Co. is another import defense contractor, with 60 pct of its output going into defense as against 50 pct last year. This electronics equipment builder advanced from $20 million sales in the first three quarters of 1960, to $55 million in the same period this year. Profits are up substantially.

Forecast for '62 — How about next year? Market research men in industrial, government, and consumer fields, expect 1962 to beat 1961 —at this point. Sellers to government users of electronic components point out this is almost a foregone conclusion in the defense area.

In consumer goods, 1962 gains are pegged on further gains in both radio and color TV.

How about industrial sales gains? With industrial sales the third and smallest member of electronics' big three, the market is still one of the fastest growing. One with the most potential: Computer installations.

Action in Beryllium

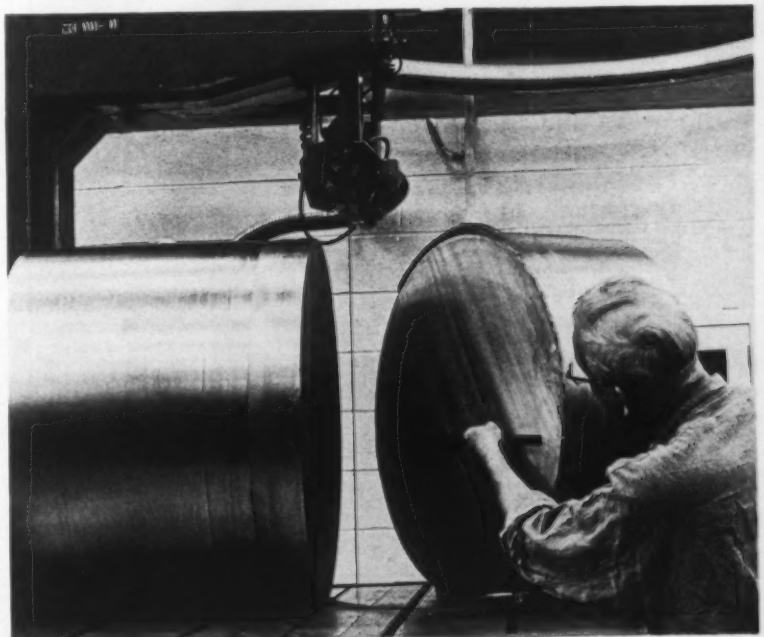
▪ The space age metal beryllium got another boost for the future last week when the leading producer, Brush Beryllium Corp. of Cleveland unveiled a new fabrication plant—third step in a 3-year, $15 million expansion.

The new $3 million plant is a highly - specialized, precision machine shop plus an elaborate inspection set-up including X-ray.

Price Factors — "These expansion steps have increased Brush's capabilities for producing beryllium products well above any other company in the world," says President George Mikhalapov. He added the new fabrication plant is expected to contribute to further reduction of the price of finished beryllium products. These now range about $75 to $150 per lb. for simple machined shapes, but prime metal costs have been halved.

Brush's capacity has been about doubled in the past three years, the final step being expansion of the Elmore, O., reduction plant expected in 60 days. Other steps have been a West Coast fabrication plant at Hayward, Calif. For aircraft and missile plants there, a new beryllium rolling plant at Reading, Pa., a new ceramic facility at Elmore, and purchase of part of Beryllium Resources, Inc., of Salt Lake City, which assures a domestic source of ore.

Stockpiling Program — A new government stockpiling program for beryllium was also announced last week which should help relieve the present excess capacity in the industry. President Kennedy approved a barter deal in which U. S. food commodities will be sent to friendly countries in exchange for their hand-cobbed beryllium ore. The trend toward use of U. S. ore would have left thousands of miners out of work in India, South Africa, Australia, Argentina and Brazil, now major suppliers. The ore will be reduced for the General Services Administration by Brush and Beryllium Corp. of Reading, Pa.



INSPECTION: Block of hot-pressed beryllium which has been sawed in two parts is inspected at new fabricating plant of Brush Beryllium Corp.

Lab Hunts Space Craft Steel

Bethlehem's $25 Million Research Facility Is Opened

Bethlehem Steel Co. opened its new $25 million centralized research laboratories.

Objectives already laid out: A special new alloy steel for space craft, and new high-strength steels for tonnage products.

■ Bethlehem Steel Co. is working on a special new alloy steel to meet the high-strength requirements of space vehicles.

It's one of the activities scheduled for Bethlehem's new $25 million Homer Research Laboratories, officially opened last week. Arthur B. Homer, chairman and chief executive officer, noted that new products will be pursued. But as much or more emphasis at the new facility will be devoted to preparing raw materials and the steelmaking process itself.

Atop Mountain—The new labs occupy 75 acres of a 1000-acre site atop South Mountain in Bethlehem, Pa. Heading the now centralized research activities is C. H. H. Weikel, vice president in charge of research.

Five main buildings make up the facility. They include administration and bench lab building, shops and warehouse, process metallurgy building, photography facility, central heating and refrigeration plant.

Two other buildings are not yet completed. One is an electro-mechanical plant. It will house both hot- and cold-rolling mills, plus equipment for research in computer-control of mill operation. The second is a mechanical engineering building for process development.

The buildings are clustered around a 210-ft diam pond which cools water for the air conditioning system.

PILOT PLANT: Research team pours experimental melt of 300 lbs of steel in process metallurgy div. pilot plant at new centralized Homer Research Laboratories of Bethlehem Steel Co.

Look Ahead—Mr. Homer sees the next 10 years bringing greater instrumentation and use of automatic controls to keep pace with refinements in the steelmaking process.

"We are developing automatic control in the openhearth," he said, "because oxygen blowing of heats is cutting the refining time in half." This makes it "more difficult to shape up the slag and otherwise control the refining process."

Another research objective: Imparting high-strength, corrosion-resistant qualities to low-cost tonnage products.

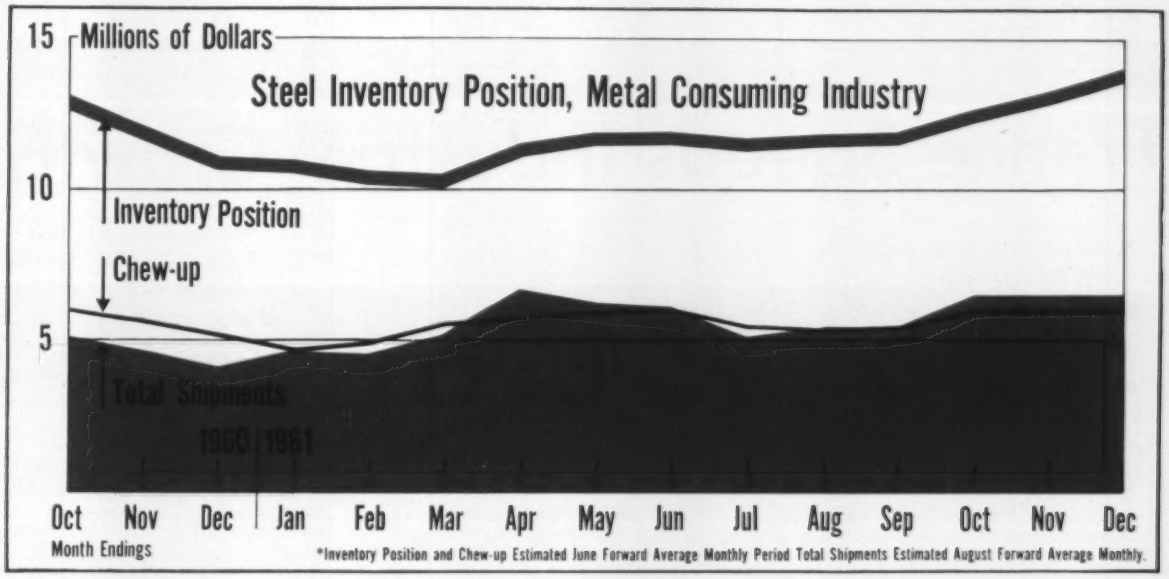
"Under present practice," said Mr. Homer, "it is expensive to produce steel which attains the highest levels of strength and durability."

Other Areas—Among other possible developments from research, Mr. Homer cited: Structural steels which may develop into a whole new family of steels; new high-strength steels for tonnage products such as shapes and plates; new kinds of coated or alloyed steels able to resist a wide range of corrosive conditions; processes by which metals like chromium, titanium and aluminum are actually diffused into the surface layers of sheet steel.

Steel Prices—Bethlehem's chairman also touched on steel prices in his opening remarks.

"Recently a great deal of concern has been expressed about the level of steel prices," he said. "It would be encouraging to see evidence of equal concern for profits.

"These laboratories were built out of profits, and they are going to play their part in bringing a better way of life to millions of ultimate users of steel products, and in bringing job opportunities to Bethlehem employees."



Steel Inventory Buildup Due

Forecast: Consumption "Plateau" for Three Months

Mills will ship more in balance of year than will be chewed-up by industry.

A new forecast of steel inventories is published for first time. It was two years in the making.

■ Stocks of steel held by metal consuming industries will rise slowly but steadily from now until the end of the year. This buildup will be due to a steel chew-up rate that will run below mill shipments.

The projection is based on a new steel inventory forecast developed by Washington's Herman B. Director Associates, a top commercial research company. Mr. Director, specializing in market research in the metals industries, also compiles The IRON AGE's annual steel consumption analysis. This analysis has proved to be a reliable and widely-used market research tool in the metalworking industries.

Shipments Up—As of September 30, Mr. Director sees steel inventories of 11.7 million tons in the hands of consuming industries. And for this month, the researcher forecasts that 6 million tons will be consumed. But mill shipments will total 6.7 million tons. This 700,000 tons in excess of consumption will result in an October month-end inventory of 12.4 million tons.

The company predicts the same shipments and consumption rate in November and December. This means inventories of steel held by consuming industries will climb to 13.7 million tons by the end of the year.

Steel inventories of 11.7 million tons in the hands of consumers and Service Centers at the end of last month are 2 million tons less than held as of September of last year. And at current chew-up rates, there is less than two months' of steel supplies in current inventories.

At the present time, the Director company has not projected inventories into 1962.

Background — The new inventory series has been over two years in the making. It required a detail analysis of over 50 major consuming industries accounting for 90 pct of steel consumption.

The important differences between markets served by Service Centers and those served directly by steel mills has been taken into account. Behind the forecasts is a separate analysis showing distribution of steel shipped from Service Centers.

Also weighed are imports of steel. This is an important factor in any analysis of U. S. steel stocks and usage, says Herman B. Director, president of the research company.

Imports—Example: Steel imports during the work stoppage caused by the last steel strike amounted to more than 3¼ million tons over normal. This, says Mr. Director, explains in large part the early completion of inventory accumulation scored in the post-strike period.

Report From France

France Speeds Industrial Growth

Metalworking in France is on the rise. Industrialists agree that growth is accelerating.

Some problems, particularly France's shaky political situation, remain to be solved.
By G. F. Sullivan

■ For industrial growth, France may be the one to watch over the next few years, metalworking there is now running 10 pct ahead of record-breaking 1960; in exports, the figure is 21 pct. Plans are to increase steel capacity by 40 pct in the next 5 years.

French industrial output has been rising by 7 pct a year for the past 10 years. This rate has been topped by Japan (13), West Germany (8.5) and Italy (8). If it keeps up, France will double her gross national product in 15 years.

Delicate Politics — To many a Frenchman, it seems almost too good to be true. He knows, of course, that barring war, one other thing could ruin the picture: Political collapse in France.

Foreign observers are less worried about that than they were before de Gaulle and they don't think his departure from the scene would be the end of the world. They look for business in France to remain as good as it is now at least until mid-1962.

Executives Speak Up—"Business is terrific," says Jean Regis, vice-president of Heurtey & Cie (industrial furnaces, petrochemical plants). "We have a building full of engineers working only on estimates."

The Heurtey organization is among the world's largest builders of industrial heating and heat treating equipment. One of its projects involves furnaces for a new integrated mill at Dunkirk; it will be rated at 550,000 net tons a year in 1962, double that in 1963.

Capital Programs—"The French steel industry, which put $840 million into new facilities between 1957 and 1960, will invest about $1.8 billion between 1961 and 1965," Mr. Regis added. This will be a 40 pct increase, to 27.5 million net tons.

France is now in its fourth four-year expansion plan (1961-1965). The first three were all on target.

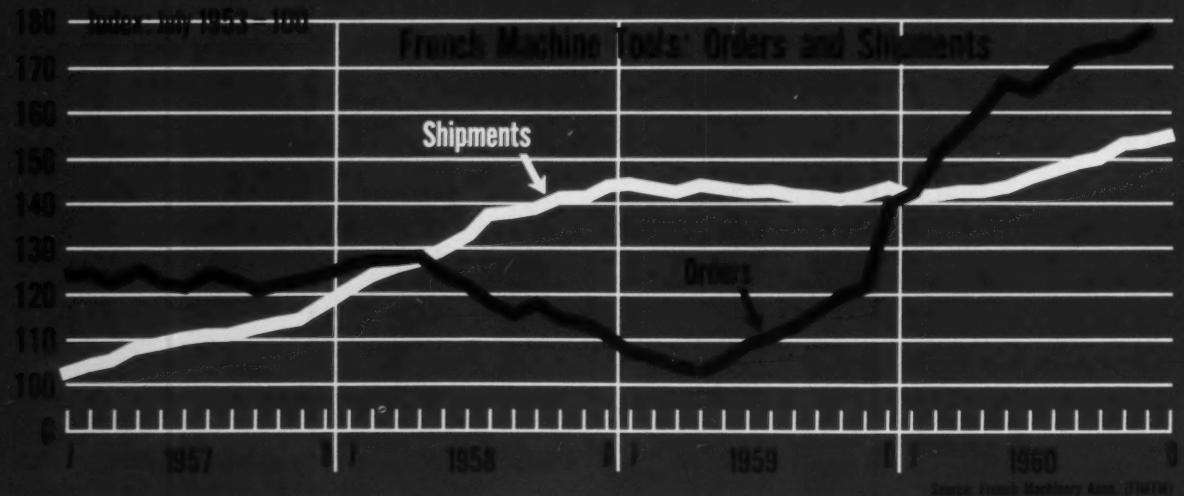
Metalworking, which in France does not include metal production,

European Metalworking

This is the last of a four-part series on metalworking industries in Western Europe.

Other articles in the series include: Brussels Machine Tool Fair, Sept. 28; Report from W. Berlin, Oct. 5; West German Steel Industry, Oct. 12.

Machine Tool Orders, Shipments Are on Rise



rolling or electrical machinery, has surprised most citizens there by its spectacular export boom. Officials at the metalworking federation (Federation des industries mechaniques at transformatrices des metaux) say they are not surprised.

Export Grows — They are pleased, yes, but argue that last year's 47.5 pct export gain is not really "some sort of a miracle." Their figures show metalworking export sales for the first half of this year of $315 million, 21 pct above the like 1960 period. Areas of greatest gains were tanks and pressure vessels, refrigeration, air conditioning, and scientific instruments.

Major export customers of the French metalworking industry, in order of rank, are: West Germany, the Benelux countries, Russia, Italy and Great Britain.

The French are not kidding themselves. They remind you that their No. 1 customer happens to be their No. 1 competitor—but West German order books are bulging; delivery dates are stretched out, so the French, like the Americans, are getting some of the business.

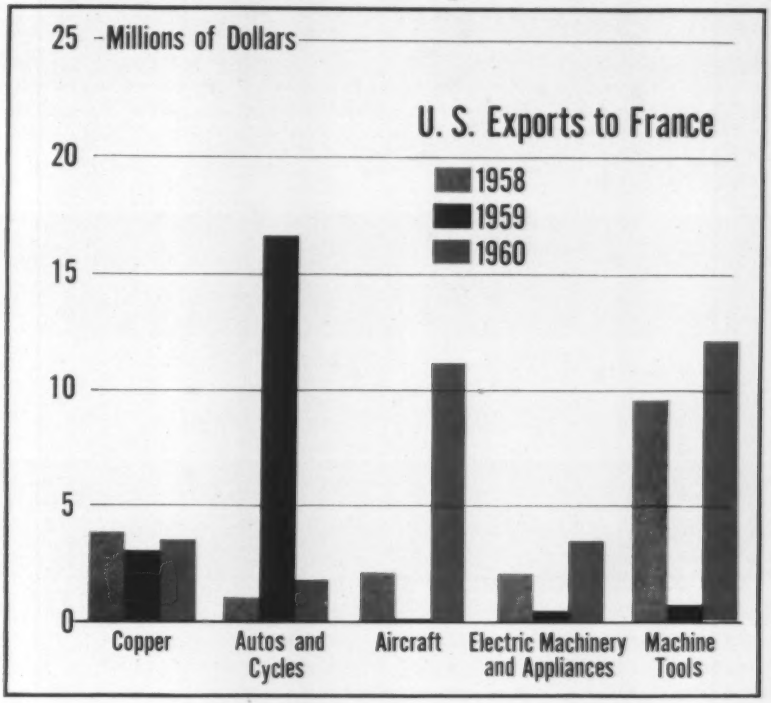
ECM Outlook—They know too that British entry into the Common Market would step up competition. Their machinery builders argue that the Common Market works both ways, that French industry must modernize more to stay competitive.

The French are also concerned about holding on to the traditional preference in North Africa for French goods. And the French auto recession has hurt metalworking.

But they claim French machinery export gains are not a flash in the pan, that they are based on a well planned and organized drive. They seem to have done a good marketing job in the export area, picking customers, areas, products, and concentrating on their strong suits. They've followed up by setting up sales alliances; companies have been getting together in groups to hit the export market.

Whether it be the sharp export gains or the steady rise in domestic sales, France is a growing factor to be reckoned with. She has a potential for industrialization vastly bigger than she had just a few years ago.

What France Buys From U. S.



JEAN REGIS: More investment in French steelmaking will increase capacity to 27.5 million tons by 1965, a boost of 40 pct over present ratings.

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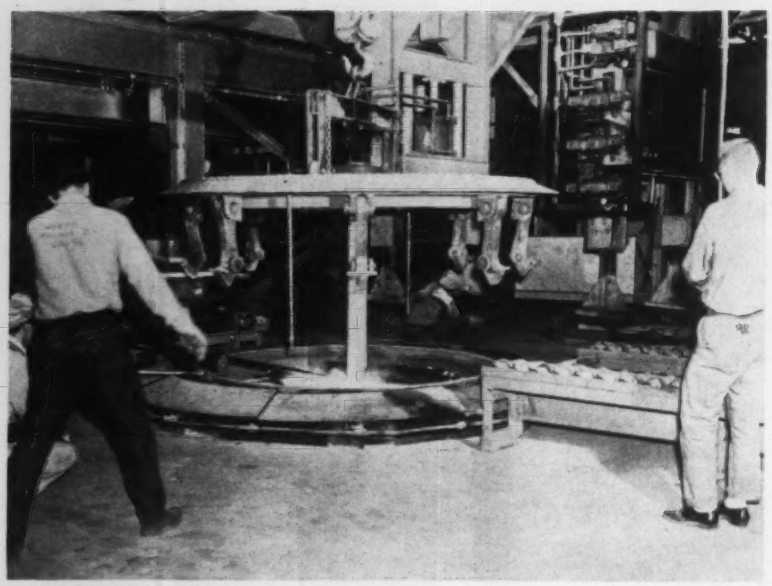
Sealing Molten Steel for Wheelmaking



CONTROLLED PRESSURE: At Griffin Wheel Co.'s new plant in Bensenville, Ill., a pressure pouring process of direct casting is used to turn out steel wheels for railroad freight cars. The plant, Griffin's sixth wheelmaking unit, was built at a cost of $6 million. It can produce 148,000 steel wheels a year. Electric furnaces provide molten steel.

Ford Settled; Chrysler Next?

Ford Motor Co. might be making cars again this week, following signing of a national agreement with the UAW Oct. 13.

But there was wonder as to whether Chrysler Corp. would be the next strike victim before the week was out.

Idled since Oct. 3 by a walkout of 120,000 union members, Ford got together with UAW President Walter Reuther Oct. 13 on a three-year national contract.

Local Problem — Although a score of bargaining units at local levels still had to reach terms, both union and management expressed hope that cars would be rolling from Ford plants early this week. Through last Friday (Oct. 13) the company had lost 80,000 cars from October's production schedule because of the strike. This is based on an 8000-unit daily program in effect when the strike began.

If Ford operations got underway, it appeared the union would immediately throw its weight against Chrysler Corp. in an effort to bring the country's third biggest car maker to terms. Chrysler has been scheduling 20,000 new cars a week during October.

Steel Mill Terms—Included in the Ford settlement was an incentive plan for workers on coke ovens and blast furnaces in the company's steel division. This is the first incentive plan for these workers, although rolling mill and openhearth employes have been on incentive programs for many years.

Incentive earnings are to be included in the calculation of holiday pay, vacation pay, insurance benefits, supplemental unemployment benefits and separation pay.

Certain employes in the steel division will get increases ranging from 5 to 24 cents an hour, both in base hourly rates and in rates used for figuring incentive pay.

M. A. Hanna Co. Shifts Direction

The sprawling M. A. Hanna Co. of Cleveland, with $500 million assets in steel, coal, ore mining and other fields faces conversion into a closed-end investment firm.

Hanna Co. directors approved a plan last week to separate the business management phase from ownership phases. This simplification "has become more and more desirable with the growing complexity of laws, regulations, and tax consequences affecting both its activities and shareholders," the directors' report stated.

Shareholders will vote on the plan Oct. 31. Hanna holdings presently amount to almost $360 million in National Steel Corp., Consolidation Coal Co., and Hanna Mining Co., plus over $85 million in other firms.

Under the new plan, G. W. Humphrey, now president, will become board chairman. Joseph H. Thompson, vice chairman, will be executive committee chairman, and W. A. Hobbs, now chief financial officer, will be president.

Aluminum Plant Sold By GSA

A government-owned aluminum plant in Adrian, Mich., has been purchased by the Harvey Aluminum Co.

The General Services Administration says the sale concluded government effort, taken by direction of President Kennedy, to find a user-buyer for the idle property. Harvey will return the plant to production.

Negotiated sales price was $3,626,100.

Agency Shop Dead In Kansas

The U. S. Supreme Court has declined to rule whether Federal law permits a state to ban the so-called agency shop. (An agency shop is one in which a labor-management contract requires a non-union worker to pay the union a sum equal to members' dues.)

The high court refused a union request to review a Kansas Supreme Court decision which found the agency shop illegal under Kansas right-to-work laws.

TENZALOY

Tenzaloy Aluminum for high-strength castings without heat treatment

When you need a high-strength aluminum casting your alloy should be self-aging Tenzaloy — particularly if you want to avoid heat treatment. *Tenzaloy has this unique combination of properties:*

1. High yield and tensile strength
2. Exceptional machinability
3. Remarkable dimensional stability
4. High impact and shock resistance
5. Excellent corrosion resistance
6. Permanent, silvery-white finish

Tenzaloy castability is excellent in green sand, plaster, investment, shell, oil-bonded sand and permanent molds of all kinds. It is particularly suited to designs where load-carrying capacity, impact strength and light weight are essential, and it is used in applications where heat treated aluminum alloys, cast iron or other materials might otherwise be selected.

Write for your copy of Bulletin 103R5 to: Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

ASARCO

INDUSTRIAL BRIEFS

Single System—Northrop Corp., Beverly Hills, Calif., has combined operations of Acme Metal Molding Co. and Arcadia Metal Products, Fullerton, Calif., into a single organization, known as Northrop Architectural Systems. Acme produces aluminum store fronts and entrances. Arcadia fabricates and installs glass doors, window and architectural and control systems.

Full Control—Hercules Motors Corp., Canton, O., has become a wholly owned division of Hupp Corp., Cleveland. Hercules is starting a retooling program for product improvement and cost reduction. It will continue to make gasoline, diesel and liquified petroleum engines.

Filter Line—Wheelabrator Corp., Mishawaka, Ind., has acquired W. W. Criswell Co., Inc., Riverton, N. J. Criswell makes filtration products for steel, chemical, mining and non-ferrous metal industries.

Branch Buy — Sandmeyer Steel Co., Philadelphia, has acquired a branch plant and warehouse at York, Pa. It will distribute precision ground steels and Sandmeyer's specialized line of stainless steel plate and plate products.

Portland Purchase — American Steel Warehouse Co., Portland, Ore., has acquired Douglas Supply Co., Roseburg, Ore. American will stock several lines of steel along with the complete line of mill supplies marketed by Douglas.

Wire Buildup — Rea Magnet Wire Co., Inc., subsidiary of Aluminum Co. of America, is building a new plant at Fort Wayne, Ind. It will manufacture, warehouse and market aluminum magnet wire.

Another Plant — Fastener Corp. is building a new plant at Franklin Park, Ill. It will triple manufacturing facilities of Duo-Fast staplers, tackers, nailers and stapler.

Magnetic Merger — All activities of Dynacor, Inc., Rockville, Md., manufacturers of magnetic tape core materials, are being merged with Sprague Electric Co., North Adams, Mass., of which Dynacor has been a wholly owned subsidiary.

Name Change — Midland-Ross Corp., Cleveland, has changed the name of Janitrol Aircraft Div. to Janitrol Aero Div. It has broadened its range of products for the aerospace market to include pneumatic controls and couplings.

Continental Shift — Continental Copper & Steel Industries, Inc., is moving to larger headquarters offices at 100 E. 42nd Street, New York City. Executive, administrative, planning and engineering depts. will be centered there.

B-L-H Buy — Baldwin-Lima-Hamilton Corp., Philadelphia, has purchased all patent, manufacturing and marketing rights to two new automatic tube-bending machines. Called Bend-O-Matic, both use punched tape to program the bending of straight tube stock to desired angles and contours.

Electrode Stepup—A. O. Smith Corp., has completed a $250,000 modernization program at the Leola, Pa., electrode plant. It has increased plant capacity to 500 types and sizes of electrodes, and doubled former production.

Aluminum Order — Reynolds Metals Co. will supply aluminum for 200 giant covered hopper cars for the Southern Railway System. Magor Car Corp., Clifton, N. J., placed the $2 million order for aluminum sheet and plate.

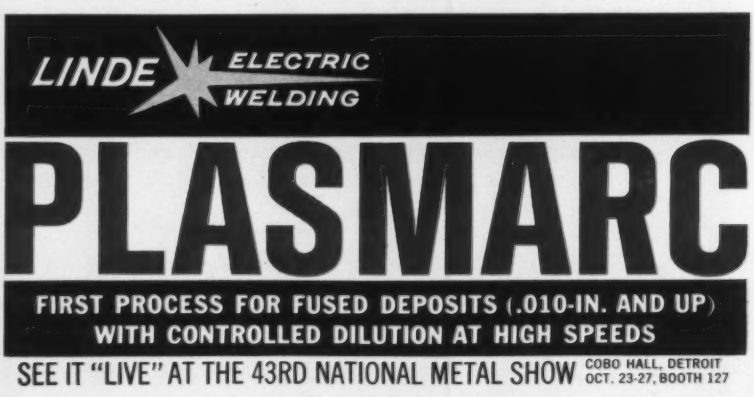
More Bars—Connors Steel Div., H. K. Porter Co., Inc., is building a new reinforcing bar fabricating facility at Birmingham, Ala. Stepped-up efficiency in reinforcing bar fabrication is keying the $500,000 project.

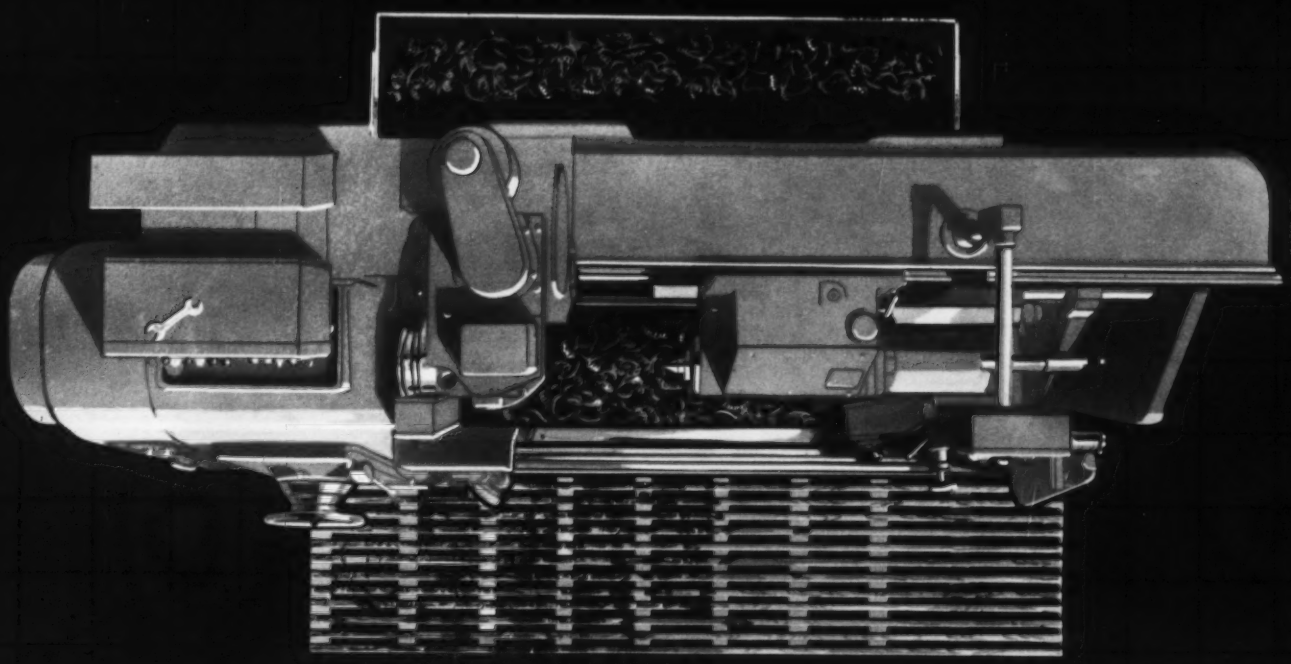
New Quarters — Western Litho Plate & Supply Co. has completed an expansion program at St. Louis, Mo. Offices and manufacturing have been moved to new facilities at 4041 Park Avenue. Automated machinery and quality control equipment have been added.

Cutting Center—Threadwell Tap & Die Co. is building a new cutting tool center at Greenfield, Mass. The Conway Manufacturing Div. will be incorporated in the new building, along with Threadwell's tap, die, keyway broach and gage manufacturing operations.

Number Six — Arwood Corp. is opening its sixth investment casting plant at Cleveland. It will be a fully integrated foundry, casting ferrous, cobalt and nickel base alloys by solid mold and ceramic shell.

Extra Addition — Tweezer-Weld Div., Federal Tool Engineering Co., is adding to the plant at Cedar Grove, N. J. It will provide extra capacity for sub-contract welding of semi-conductor and other electronic sub-assemblies.





You can turn a profit on a New Britain +GF+ Copying Lathe

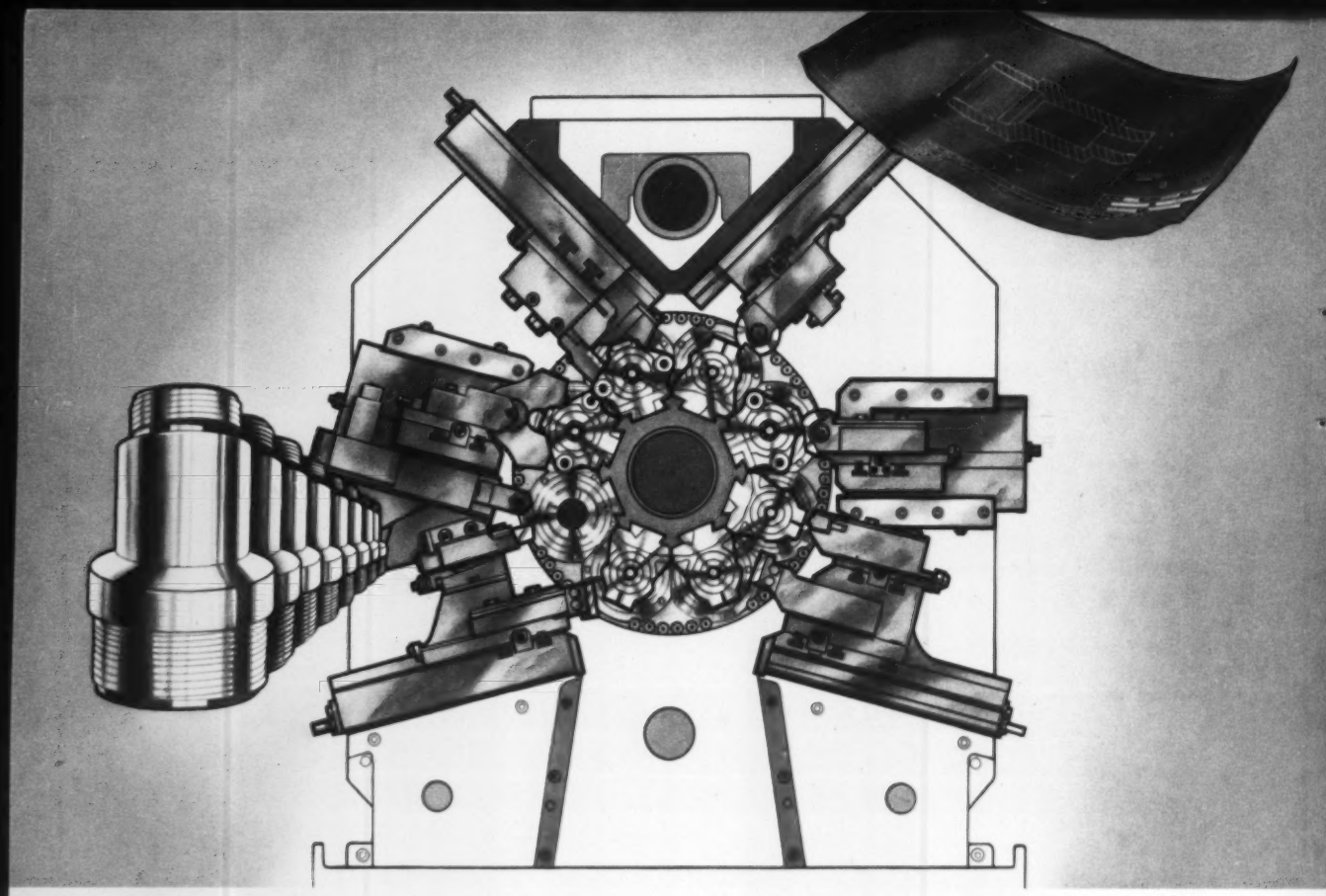
Here's a birdseye view of a New Britain **+GF+** Copying Lathe. It shows some important differences between this machine and conventional lathes with copying attachments. The point here is this—*the most effective use of the single-tool copy-turning principle can be made only with a machine designed from the ground up for this type of work.* The New Britain **+GF+** is just such a machine. Notice the chip pan. It's big (it has to be) and located for easy removal of chips from the back of the machine. The design of the work area allows for unobstructed free-fall of chips out of the way and into the pan.

The New Britain **+GF+** is massive and rugged, with plenty of power—up to 40 h.p., if you need it. It's simple to operate, quick to set up and change over. The single-point tool can be changed in one minute and it out-produces gang tooling setups in the bargain. Turning is controlled by either a template or a prototype. External and internal copying are accomplished in one set-up with special tooling.

The possibilities for short or long run chucked and between centers work on the **+GF+** are wide and varied. Because the work is produced with good surface finish and dimensional accuracy, grinding can be reduced and, in some instances, eliminated. Large diameters are broken down economically by successive parallel cuts, automatically if desired, with optional two-cut or multi-cut recycling.

You've got to see one of these machines in action to fully understand the kind and quantity of work they are capable of producing. Contact your New Britain Representative for demonstration arrangements or write The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.

THE NEW BRITAIN MACHINE COMPANY
New Britain-Gridley Machine Division - New Britain, Connecticut



Unlimited tooling combinations with New Britain Bar Machines

Nothing can out-date your operation quicker than better machines in the hands of a competitor. In the race to keep ahead on quality, price and delivery, nothing can put you out front faster than machines capable of consistently producing the highest quantity of finished pieces at the lowest possible cost. New Britain's new series of bar machines represents in every way the most advanced bar-turning units available. Each of the four-, six- and eight-spindle models has been redesigned, adding new features and improving older ones. Unlimited cross slide and end-working tool combinations, extremely fast operation (even on stainless) and a variety of models and features to choose from add up to some good reasons for incorporating New Britains into your replacement or production expansion plans.

The eight-spindle model is the largest, most modern eight-spindle bar machine available. It has a stock capacity of up to 2⅝" and provides six independently-operated cross slides. As with all New Britain bar machines, the operations of the cross slides and end-working tool slide are disc-cam controlled for positive actuation, close tolerance machining and easy, rapid change-overs.

This is only a very small part of a story that is bound to interest you. The whole story and its significance in terms of your profits is available from your New Britain Representative. If you prefer, contact us directly at The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.

THE NEW BRITAIN MACHINE COMPANY
New Britain-Gridley Machine Division - New Britain, Connecticut

How to Plan Manpower Programs

Explosive forces are at work reshaping your manpower needs and training objectives.

Rapid shifts in the work force and the economy will demand some drastic changes in management thinking.

▪ Manpower planning is growing more complex. Your recruiting, training, and development programs will be shaped by far-reaching changes. These forces, some pulling in different directions, will make planning difficult.

They will not be minor revisions, but major changes in thinking. One steel executive, Forrest H. Kirkpatrick, assistant to the president, Wheeling Steel Corp., believes there will be a "basic revision of concepts which have dominated management thinking for a half century or more."

Complex and Technical — What are these changes?

Four trends are listed by Mr. Kirkpatrick:

The explosive growth of science yielding knowledge affecting every function of management.

Rapidly increasing technology in both office and factory, and related areas such as transportation, finance, and communication.

More complex industry relationships with government, consumers, suppliers, unions, stockholders and the public.

Changes in the work force with the rapid growth of "exempt" salaried personnel.

Shortage and Surplus — Another personnel expert, O. A. Ohmann, director of employee relations, Standard Oil Co., mentions these added influences:

Labor shortages in such groups as scientists, market analysis, and sales strategists, with growing surpluses of unskilled and unteachable workers.

A volatile economy with rapid and extreme swings in which timing will be critical.

A domestic market increasingly integrated with world markets.

These changes and others, both men point out, will have a profound effect on management decisions about personnel.

Mr. Kirkpatrick foresees an increase in the employment of what he calls "the knowledge people."

But, he warns, managing these specialists will be difficult. "Present management strategy, policies and practices are generally inappropriate to the task of directing and controlling the efforts of the highly trained specialist."

Traditional strategies will become more and more inadequate, he believes. "Management by objectives and self-control will inevitably replace management by authority and externally imposed control."

Better Ways to Get Results

▪ More emphasis on objective management is also stressed by Dr. Ohmann in a recent address at an American Management Assn. conference.

This style of management will be used as a way to get better results, develop people, and gain acceptance of corporate goals and technical change, he notes.

More Jobs, Tighter Standards— But other areas of employee relations will also expand. For example, business will be expected to spend more time developing new jobs for workers of limited skill and capability.

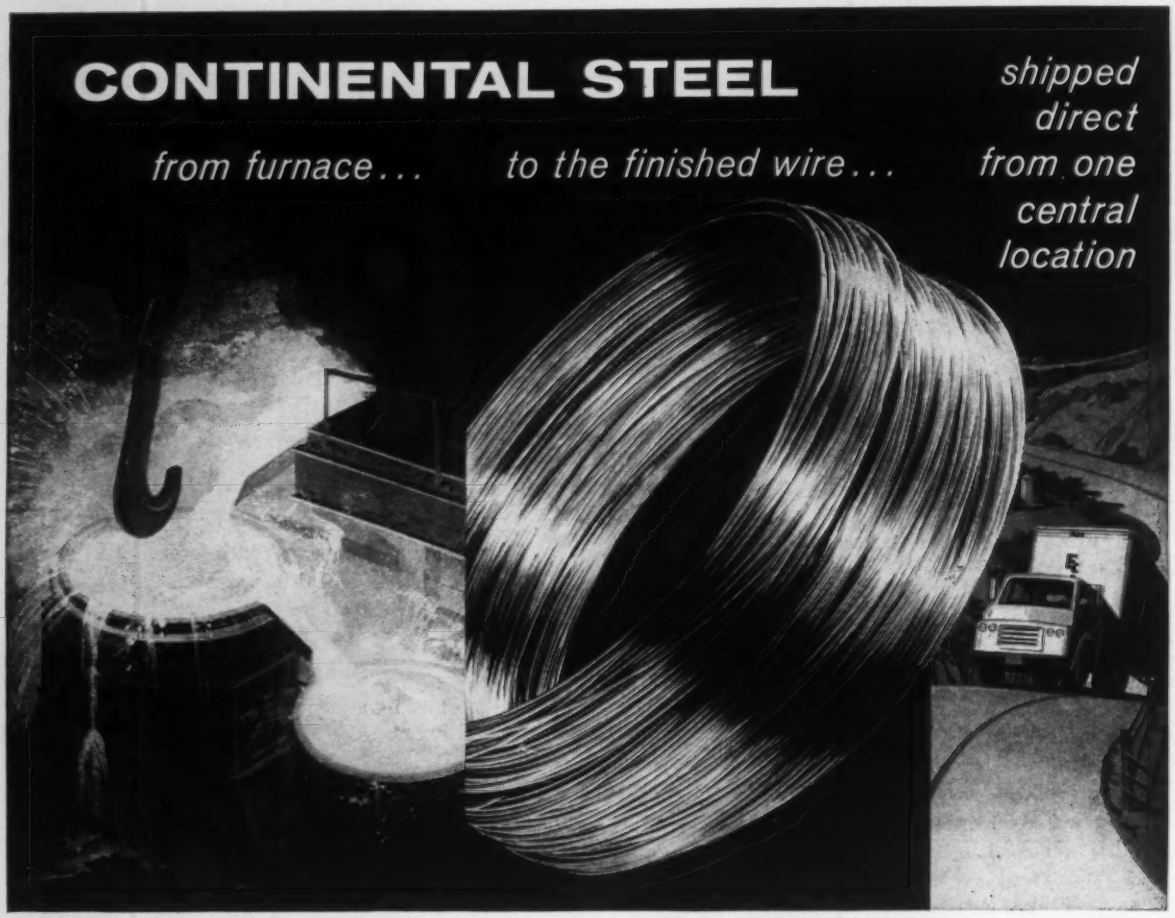
Because of rapid technical advance and automation, more workers will develop job insecurities. As a result, management must improve its communication of plans and problems.

However, the drive for increased productivity suggests tighter job standards, Dr. Ohmann observes. There will be attempts to eliminate restrictive work rules limiting flexibility.

Freedom With Control — Development of control and coordination through data processing will bring more centralized decisions, and tighter integration of operations.

Dr. Ohmann concludes, "Obviously the personnel image of the corporation as the 'great white father' who looks after his dependent employees is already undergoing drastic change.

"We may discover a better objective for personnel practice will be providing greater opportunity for individuals to develop responsible self-reliance and independence. This will contribute to their flexibility to adapt to changing jobs and business conditions."



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Steel

More Metals Lost in Plymouth

Comparison With 1961 Shows Drop in Materials

Like many of the new cars this year, the smaller 1962 Plymouth uses less materials.

Comparison with the 1961 model shows how iron, steel, aluminum and other metals have been cut down.

By A. E. Fleming

▪ When Plymouth made its 1962 model smaller than the 1961, there was a significant reduction in materials used.

Wheelbase was shortened 2 in., to 116 in.; length dropped 7.5 in., to 202 in.; and width narrowed 4.6 in., to 75.4 in.

Compilation of material weights in a 1962 Plymouth, compared with a 1961, shows the effect smaller dimensions have on requirements of iron, steel, aluminum and other automotive staples.

Two Models — For purposes of comparison, the 1962 model is a Savoy 4-door sedan with V-8 engine, automatic transmission, radio and heater. The 1961 is a Savoy 4-door sedan with V-8 engine, automatic transmission and power steering.

Figures are based largely on engineering estimates of net finished part weights.

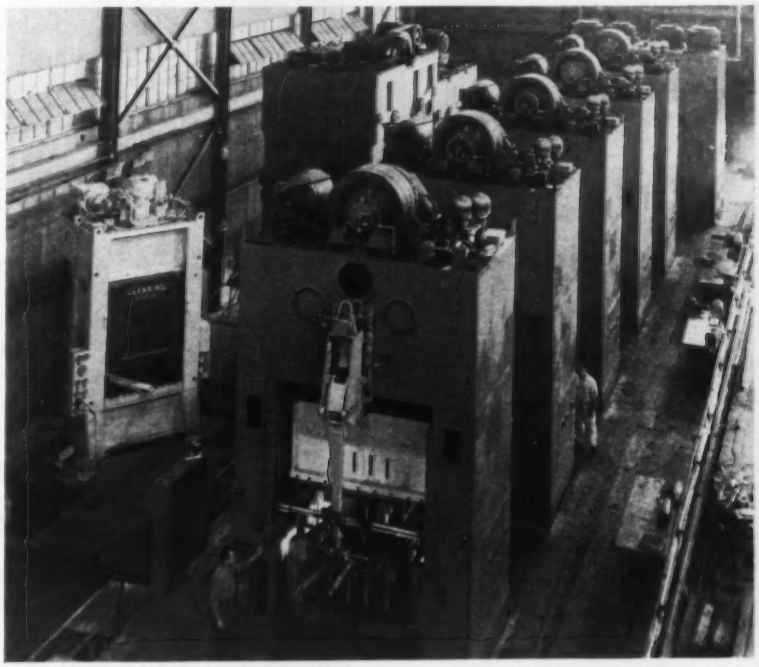
Total weight of the 1962 car is 3343.9 lbs, or 9 pct less than the 1961 which scaled 3665.4 lb.

1962 Breakdown — By pounds, the materials breakdown of the 1962 model is: Cast iron, 436.0, or 13 pct of total car weight; malleable iron, 77.4, or 2 pct; plain carbon steel, 1824.8, or 55 pct; galvanized steel, 51.0, or 1 pct; aluminized steel, 23.9, under 1 pct; alloy steel, 114.7, or 3 pct; stainless steel, 8.4, under 1 pct; aluminum, 69.5, or 2 pct; magnesium, 1.9, under 1 pct; zinc, 37.8, or 1 pct; copper-bronze-brass, 37.2, 1 pct; lead, 29.0, under 1 pct; glass, 87.1, 2 pct; rubber, 186.4, 5 pct; plastics, 19.5, under 1 pct; soft trim, 45.1, 1 pct; sound deadeners and sealers, 46.7, 1 pct; paper-cardboard-composition, 27.9, under 1 pct; paint, 20.5, under 1 pct; body solder, 5.0, under 1 pct; fluids and lubricants including full fuel tank, 194.1, 5 pct.

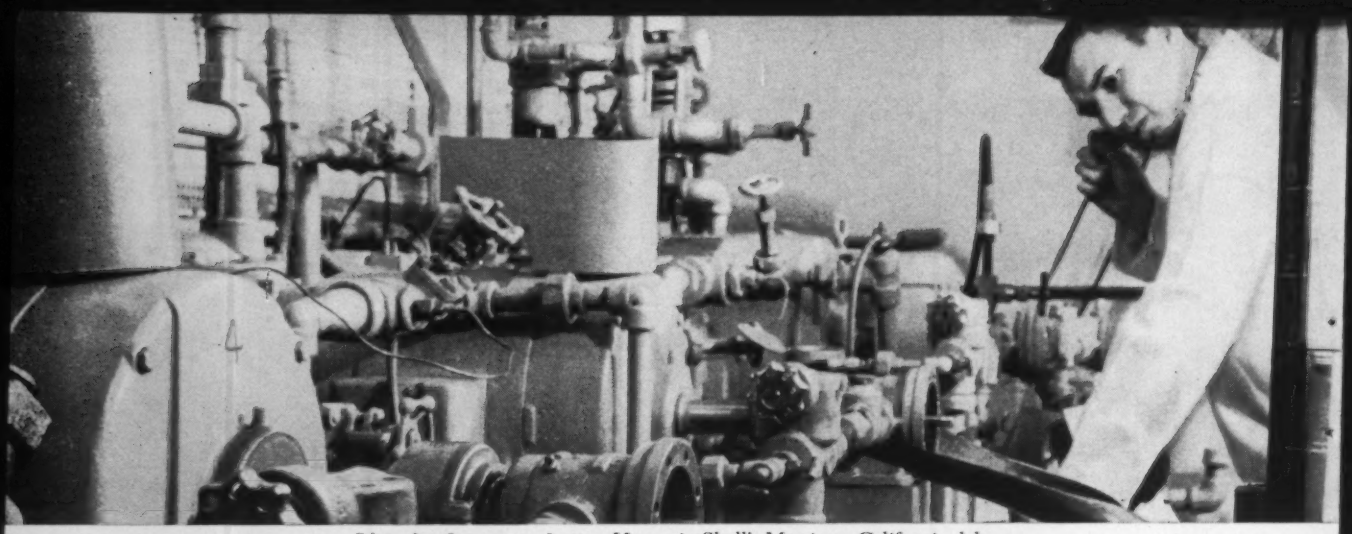
1961 Breakdown—Breakdown of 1961 model materials: Plain cast iron, 370.5, or 10 pct; alloy cast iron, 195.2, or 5 pct; malleable iron, 81.3, or 2 pct; plain carbon steel, 2238.1, 61 pct; alloy steel, 212.3, 6 pct; aluminum, 61.6, 2 pct; zinc, 44.0, 1 pct; copper-brass-bronze, 45.3, 1 pct; lead, 29.1, under 1 pct; glass, 106.6, 3 pct; rubber, 215.7, 6 pct; plastic, 32.0, under 1 pct; miscellaneous, including pads, cloth material, fiber, 33.7, under 1 pct.

Carbon Use—Main use of plain carbon steel, most widely used metal, is in body and chassis structure. Carbon steel parts are fabricated several ways, but stamping is most popular. It accounts for 82 pct of the parts made from this material.

Auto Automation for Japan



HEADED OVERSEAS: Giant line of automated presses is headed for Nissan Motor Co., Tokyo. Built by Clearing Div. of U. S. Industries, the line will be disassembled and shipped to Japan within the next month.



Listening for pump chatter. Here—in Shell's Martinez, California, laboratory Shell Tellus hydraulic oils are subjected to the most demanding tests.

BULLETIN:

Shell presents a question-answer guide to help you select the hydraulic oils for top performance

Selecting the proper hydraulic fluid for your equipment can be one of your most important decisions. And it can pay off in many ways. Less down-time. Longer equipment life. Lower cost per unit.

Here are six bench marks to help you pick the best hydraulic oil for your plant requirements.

1. Does it have good oxidation stability? Oxidized hydraulic oil can form gums, lacquers and other deposits which may foul moving parts. Shell Tellus Oils are carefully refined to remove unstable, sludge-forming components—then fortified with a Shell-developed oxidation inhibitor.

2. Will it resist foaming and emulsification? Pump chatter and erratic operation are often the result of pump cavitation, brought on by oil foaming. Tellus® Oils contain additives to help prevent foaming.

3. Does it fight rust and corrosion? It is difficult to exclude all moisture from a hydraulic system. And moisture can form troublesome rust. Shell Tellus Oils have been carefully compounded to resist corrosion.

4. What are its lubrication qualities in continuous service? Shell Tellus Oils form a clinging, oily film on mating metal surfaces. This maintains a constant guard against wear.

5. How does it react to temperature changes? This is a key factor in the performance of hydraulic equipment. Careful selection of the proper viscosity grade of Tellus assures satisfactory operation of your system over its entire temperature range.

6. Is it available in several viscosity grades? Shell Tellus Oils are available in a broad range of viscosity grades. There's a special grade for virtually every hydraulic requirement.

Ask your Shell Industrial Products Representative for facts on Tellus Oils. Or write: Shell Oil Company, 50 West 50th St., New York 20, N. Y.

A message to manufacturers of hydraulic equipment

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Pace Quickens in West Recovery

Third Quarter Gains Should Lead Into a Good 1962

Economists, executives, and pollsters agree that business is on the upgrade for the Farwest.

Southern California, Nevada, Arizona lead in greatest percentage of business optimists.

By R. R. Kay

■ What's the 1962 business outlook?

"A very strong year," says S. Clark Beise. He's president of the nation's largest private bank, Bank of America, San Francisco,

Mr. Beise looks for a brisk pickup in fourth quarter business. And next year, he believes, the gross national product should jump 9 pct.

Broad Pickup — For metalworkers charged with forward planning, that's surely encouraging.

Everywhere you turn in the Farwest, there are signs that the industrial tempo is quickening. Many high-placed industrialists have told The Iron Age that they expect 1962 to be one of the best years yet.

In the Farwest, the second 1961 quarter showed the strongest quarter-to-quarter gain in two years, a Prudential Insurance Co. report shows.

Results Are In — Every three months Prudential polls 1000 businessmen. They make up the company's Western Business Forecast Panel.

Here's a quick rundown of its latest opinions:

(1) Farwestern business will continue to get better during the final 1961 quarter.

(2) Some 59 pct of the panel members say their business will increase from the third quarter.

(3) About 85 pct expect their fourth quarter business to equal or exceed the same period last year.

Most optimistic region: Southern California-Arizona-Nevada.

Emphasis on Design

To-morrow's engineer will have to develop vast and complex machines and systems in fields unknown today.

That's the opinion of Dr. Allen B. Rosenstein of the University of California at Los Angeles engineering department's Educational Development Program.

"As an undergraduate, the engineering student gets a heavy dose of basic science. As a graduate, he concentrates on research, mainly in math and the physical sciences. The big hole in his education is the discipline of design," Dr. Rosenstein says.

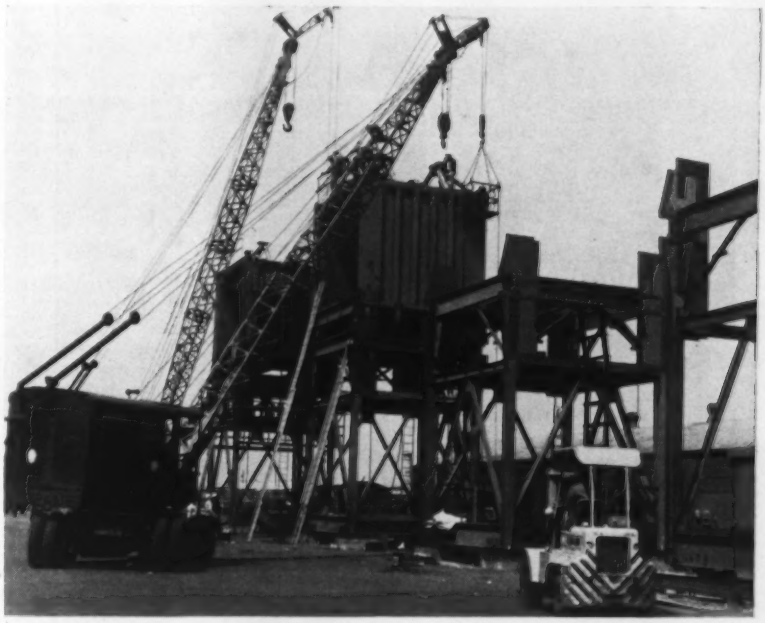
"Only through a highly developed design skill can the engineer rise above the narrow specialties and tackle problems in vast and yet uncharted fields."

"Far Out" Craft

A far out project at Boeing is the U. S. Air Force's "dream" craft.

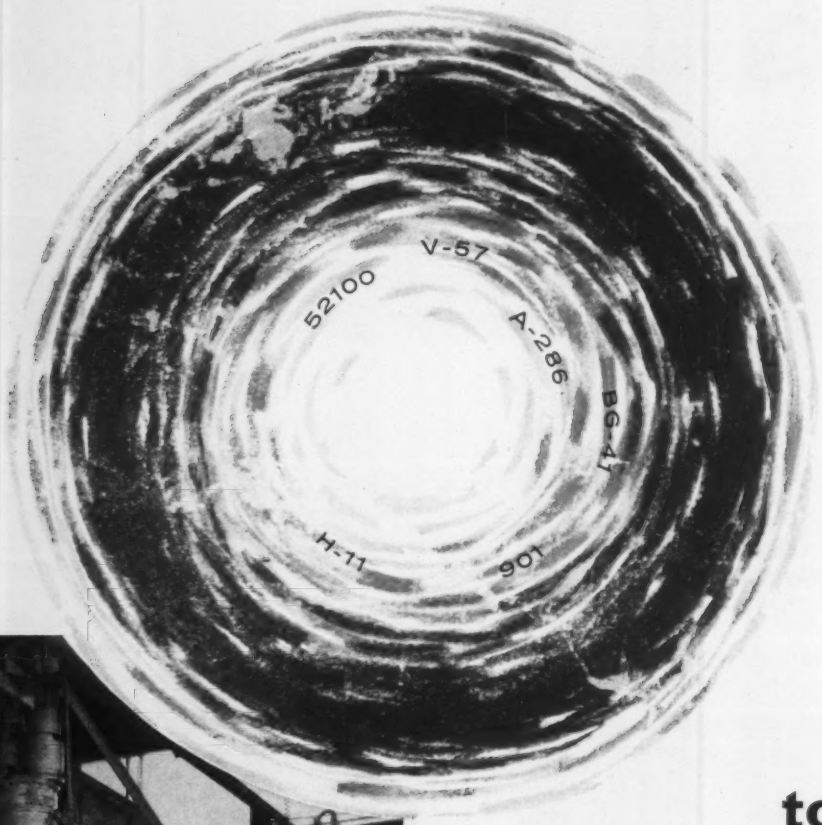
It's an aerospace plane which could fly through the atmosphere, collect fuel from the blanket of air that surrounds the earth, enter space—and return to earth again.

Going Up, But Coming Down Soon

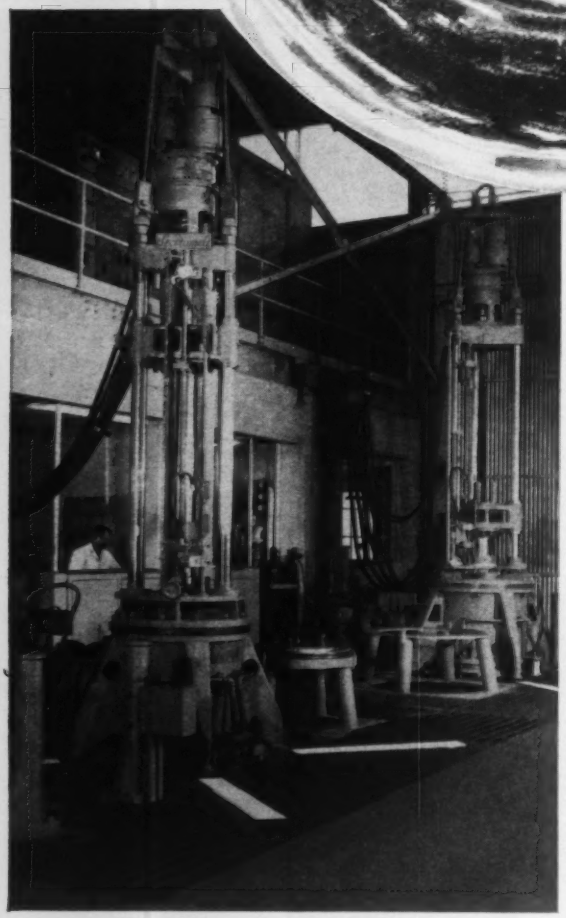


COUNTDOWN: Test erection of Atlas "silo" launcher platforms is in early stages at U. S. Steel's Consolidated Western Div. at Los Angeles. After test erection, the 75-ton structures are dismantled for shipment to six Atlas operational bases in this country. USS-CWS is doing the fabricating under contract to General Dynamics Astronautics.

AT LATROBE . . . PROGRESS HAS THE GREEN LIGHT



jet age roars to new horizons



PROGRESS MOVES FORWARD! CAPACITY MORE THAN DOUBLED! NEW 30" CONSUMABLE ELECTRODE FURNACE JOINS 20" UNIT.

AND supporting this technology is the know-how and experience of Latrobe Steel Company in specialty steel making . . . and its new, dynamic Vac-Arc furnaces keeping pace with tomorrow's fast moving developments.

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Tape Pays Off in Small Shops

Automakers' Orders May Force Tooling Automation

Small tool and die shops have held back from tape-controlled operations.

But automakers are now ordering tape machines for die work. Tooling shops may be forced into automation in order to survive.

By R. H. Eshelman

■ Can tape automation pay off in the small shop?

Middle-size plants report great success with drilling-type operations. Aircraft manufacturers have been using large numerical profilers for die work.

But the independent tool and die shops, as well as small specialty shops, have held back. One reason: The newness of electronic control; another, the substantial initial investment.

Forced Play—There may still be doubters. But major automakers are beginning to order tape machines for die work. Tooling shops may be forced into this "flexible" automation to survive.

Now, perhaps the first commercial job shop based solely on tape controlled operations is crashing through the second barrier. Both the company's president and owner have considerable technical background and unshakeable faith in the electronics field.

Electronics Era—Numeric Machining Inc. located in Minneapolis. With a large electronics industry in the area, the choice was logical.

A nucleus of operators were trained to handle tooling, setup, servicing and programming of the K & T Milwaukee-Matic machine.

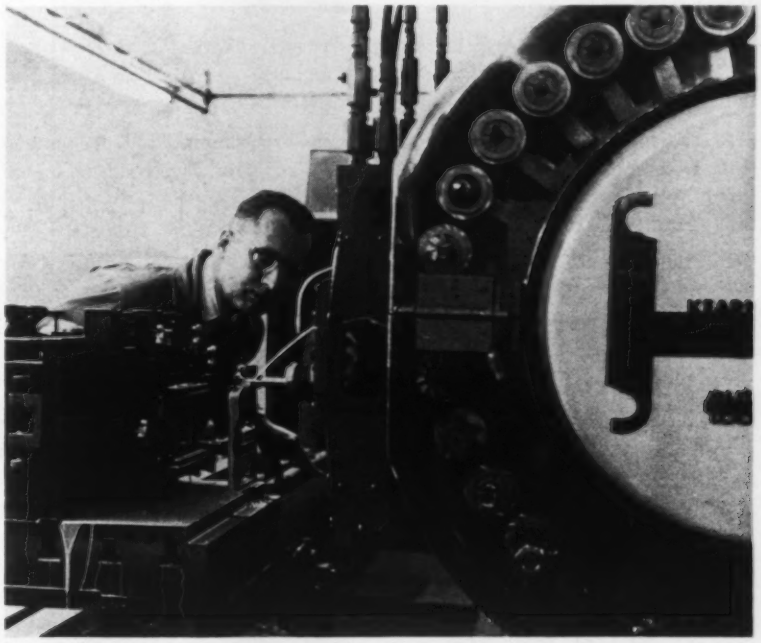
President Dan Stenoien knows what it can do. He was a design engineer with Kearney & Trecker in Milwaukee, and helped to develop the unit. He also served as a sales engineer in the field.

Specific Range — Mr. Stenoien feels the place for numerical manufacture lies in the range of 50 to 500 part-pieces per year. They probably will be complex or unusual parts that require many setups for conventional drilling, reaming, boring, facing, tapping, milling and similar operations. Even with hard tooling, it may be tough to hold related tolerances required.

On the multi-tooled unit, it's simple. The tape coordinates the job. For instance, on a cast business machine frame, drilling, milling, and tapping is required in many planes. The part was designed to be light. So it is tough to hold without warpage or distortion. Mr. Stenoien figures he can cut costs on service parts for the manufacturer by four or five to one, maybe more.

Other Potential—On other prototype, experimental and pilot runs, he predicts equally great opportunity for savings.

Shop owner Elmer Hankes estimates typical job-type operations would pay for the tape machine within eight years. However, its versatility, and the fact one job can be loaded while another is running, could speed up the amortization greatly. With maximum utilization, it could be cut to three years.



SIMPLE SYSTEM: Numeric Machining Inc. operator checks cutting fluid flow on Milwaukee-Matic at start of new cycle. Simple work holding fixture allows complex part to be finished in two setups.

MEN IN METALWORKING

J. G. Munson, Jr., appointed asst. to administrative vice president, production, United States Steel Corp.

Kennecott Copper Corp.—C. D. Michaelson, appointed vice president, mining; G. B. Russell, appointed treasurer and comptroller; J. C. Kinnear, Jr., appointed general manager, Western Mining Divisions.

Sterling Electric Motors, Inc.—A. E. Grazen, appointed president and general manager.

Freeport Sulphur Co. — R. C. Hills, elected president; R. C. Wells and T. R. Vaughan, elected members of the board.

Babcock & Wilcox Co.—J. D. Hitch, Jr., appointed general manager, international sales, Boiler Div.

Anaconda Co.—R. S. Newlin, elected director.

Motorola Inc. — H. L. Marrs, elected vice president, sales, and W. J. Weisz, elected vice president, communications products, Communications Div.

Ladendorf Co. — J. D. Stank, elected vice president.

Controls Co. of America—G. D. Becker, named group vice president; A. L. Topp, appointed general manager, Heating & Air Conditioning Div., and elected a vice president of the corporation.

Union Carbide Corp. — W. R. Lewis, appointed a vice president, Union Carbide Ore Co. Div.

Fairbanks, Morse & Co.—F. C. DiLuzio, named vice president—engineering, Beloit Group.

Altamil Corp.—A. D. Murray, named vice president in charge of manufacturing.

Kaiser Aluminum & Chemical Corp.—F. R. Morrow, appointed manager, New York office, International Div.

E. S. Bunn, elected vice president, in charge of research and development, Revere Copper & Brass Inc.

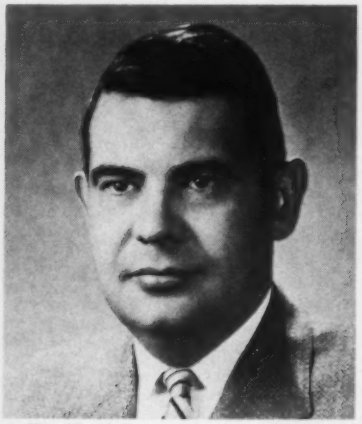
Kaiser Steel Corp.—W. L. Saccani, appointed superintendent, Oxygen Steel Production Dept., Fontana plant; W. A. Bringham, appointed asst. superintendent, Open Hearth Steel Production Dept., Fontana plant; J. I. Dodson, appointed superintendent, Metallurgical Dept., Fontana plant.

National Steel Corp.—R. S. Corder, named division metallurgists, sheet mill, and A. G. Seifert, appointed technical service representative, eastern district, Weirton Steel Co. Div.

Process Equipment Trading Co.—Howard Crossley, appointed general manager; N. E. Brown, appointed asst. general manager.

(Continued on P. 126)

W. J. Cleary, Jr., named general manager, carbon sales, McLouth Steel Corp.



W. H. Adamson, named general manager, stainless sales, McLouth Steel Corp.

H. D. Anderson, named general manager, stainless distributor sales, McLouth Steel Corp.

Ohio Rolls

Shaping Metal for all Industry

THE OHIO STEEL FOUNDRY COMPANY
LIMA, OHIO

OHIO IRON and STEEL ROLLS

Carbon Steel Rolls	Flintuff Rolls	Denso Iron Rolls
Ohioloy Rolls	Double-Pour Rolls	Nickel Grain Rolls
Ohioloy "K" Rolls	Chilled Iron Rolls	Special Iron Rolls
Nioloy Rolls	Forged Steel Rolls	

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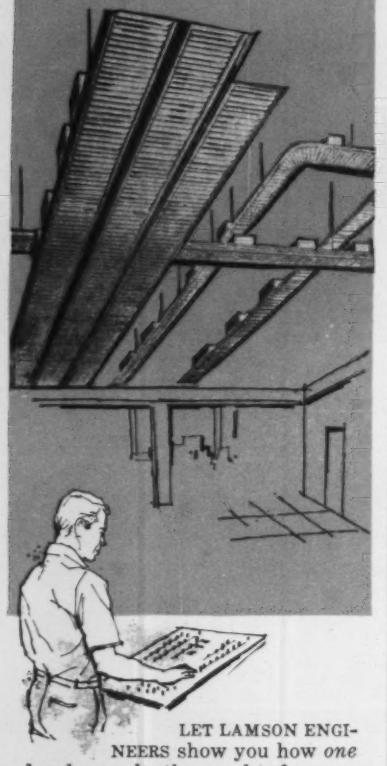
OR-44

LAMSON
CONVEYOR SYSTEMS
when two heads aren't better than one...



LET LAMSON ENGINEERS show you how *one* head can do the work of many. The purchase of conveyor components alone is not enough. It takes skill, imagination and years of experience to mould components into a directed conveying system that will increase materials flow while reducing man hours of labor time.

LAMSON engineers have such a record of achievement. Not content with the design of a system and the provision of LAMSON components, LAMSON engineers also install the system, train user personnel in its use and critically check operation.

LAMSON is famous for providing a finished, "Turn Key Job." So . . . if you have too many heads moving too few units, check LAMSON for advice. Write today to 104 Lamson Street, Syracuse, New York.

LAMSON

LAMSON CORPORATION

(Continued from P. 124)

R. E. Williams, appointed vice president, sales, Youngstown Sheet & Tube Co.

Anaconda Wire & Cable Co.—A. W. Dunham, named manager, Utility Products Div.

Armco Steel Corp.—M. E. Dowden, named manager, scrap purchases, Sheffield Div.

Cohu Electronics, Inc. — H. E. Kurzweg, appointed applications engineer, Kin Tel Div.

Wilton Tool Manufacturing Co., Inc. — A. J. Furman, appointed manager, manufacturing.

General Motors Corp. — J. H. Lamb, named executive in charge of procurement; N. J. Stock, appointed manager, purchases, Cadillac Motor Car Div.; E. A. Illy, appointed asst. manager, purchases, Cadillac Motor Car Div.

W. H. Rowand, named vice president in charge of marketing dept., Boiler Div., Babcock & Wilcox Co.

Thompson Ramo Wooldridge Inc.—R. J. Nelson, appointed district manager, eastern region, TRW Computers Co. Div.

Acoustica Associates, Inc. — C. W. Thomas, named marketing manager, Advanced Systems Div.

General Electric Co.—L. J. Geiger, appointed manager, marketing, Process Computer Section, Phoenix.

Wheelabrator Corp. — R. C. Ochs, named chief accountant, Lord Chemical & Equipment Div.

Granite City Steel Co. — D. P. Cairns, named plant engineer, blast furnace dept.

National Lead Co.—K. F. Koegler, named asst. manager, Doehler-Jarvis Div.; J. W. Thees, appointed manager, Toledo Plant 2.

Ajax Magnethermic Corp. — A. B. Flury, named manager, southeast regional sales office, Atlanta.

Blaw-Knox Co. — J. A. Lombardi, named engineer-sales, National Alloy Div.

Dravo Corp.—C. R. Cox, appointed manager, Pittsburgh district office, machinery sales dept.

Empire-Reeves Steel Corp.—T. A. Reeves, named asst. vice president, sales; D. S. Bergert, named general manager, sales, Reeves Div.

E. W. Bliss Co.—B. E. Meyer, named sales manager, Hastings (Michigan) Div.

Fairbanks, Morse & Co.—J. M. Klivans, named national sales manager, closed-circuit television; P. E. Featherstone, named marketing manager, special electronic products.

Great Lakes Steel Corp.—E. J. Montry, named district sales manager, Grand Rapids office; D. H. Coon, named manager, general sales office, Sales Dept.

Pangborn Corp.—A. J. Szabo, named sales engineer, Cleveland district.

Pittsburgh Metals Purifying Co., Inc.—J. D. Dagenhard, named sales representative.

M. C. Patterson, elected president and treasurer, Saginaw Bearing Co.

Torrington Manufacturing Co.—H. G. Cunningham, appointed sales engineer, Middle Atlantic states, Machine Div.

Washington Steel Corp.—H. H. Hildreth, appointed asst. sales manager.

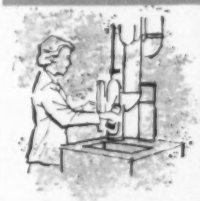
Borg - Warner Corp. — F. A. Flower, appointed manager, Washington, D. C. office.

Dana Corp.—R. L. Gilpin, appointed sales manager, Universal Joint Div.

Electric Autolite Co.—D. C. Silka, appointed sales office manager.

Hancock Telecontrol Corp.—W. M. Sheahan, appointed sales representative, Detroit district.

R. H. Wasz, appointed asst. vice president, Joseph T. Ryerson & Son, Inc.



Speed foundry samples (or any other kind) to the laboratory by AIRTUBE at 25 feet per second. Time saved in transit is time gained in production.

The sheer delivery speed of LAMSON AIRTUBES has enabled many industries to streamline their quality control programs, effecting a corresponding increase in production.

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Be sure you have the up-to-date story on LAMSON AIRTUBE SYSTEMS. Send for the new AIRTUBE catalog. Just clip this advertisement to your letterhead and mail to 104 Lamson Street, Syracuse, New York.

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PIONEERS *the Conquest* OF INNER SPACE

LAMSON CORPORATION

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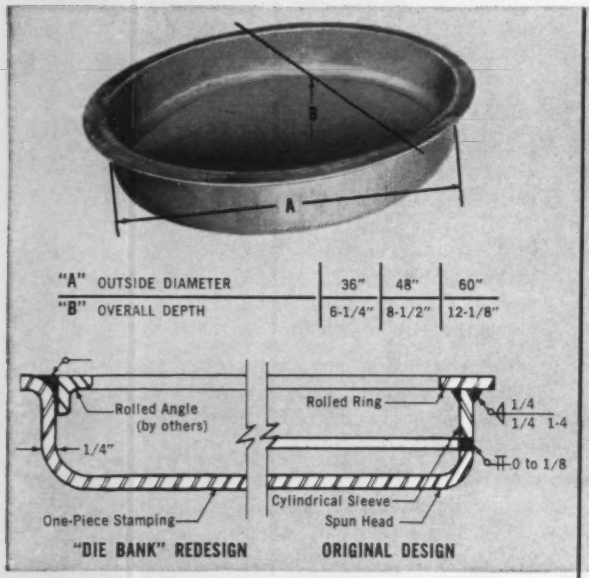
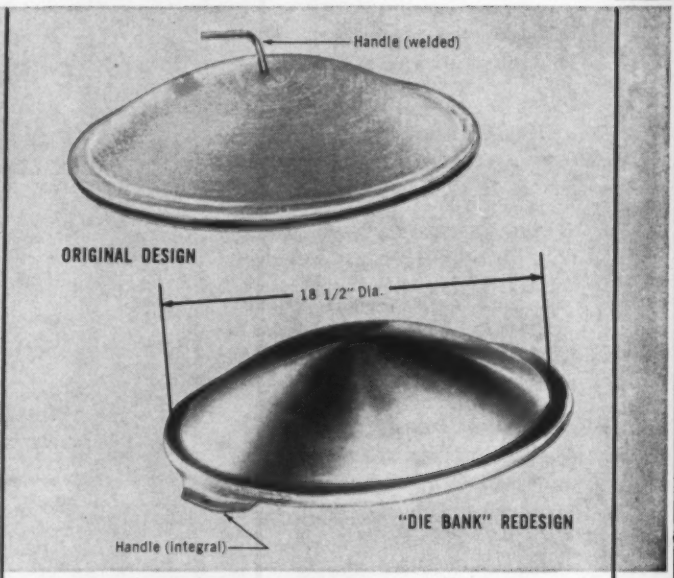
Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

Superior Parts at Lowered Cost with This Fresh Approach to Stamping

Many parts in use today are better as a result of design refinements suggested by COMMERCIAL's stamping experts. The examples below demonstrate how these design refinements have resulted in superior parts for the OEM at lowered cost. These examples may appear to you as unusual in design and this is the point...





One Piece Stamping . . . Improves Appearance, Replaces Three Piece Weldment

Circular steel boiler doors 36", 48", 60" diameter were formerly fabricated from three basic components—spun head, cylindrical sleeve and ring rolled the hard way.

Problem: eliminate accumulative assembly variables caused by inherent non-uniformity of three components—upgrade product appearance.

Solution: one piece smooth surface COMMERCIAL steel stamping shaped in a die assembled from stock "die bank" components (for details of "die bank", see box upper right). Stamping tolerances plus or minus 1/16" (flat across flange within 1/16"). Result—accurate finished product because former difficult assembly and time-consuming fitting-up problems eliminated. All outside exposed welds (about 16 ft. on the 48 in. side) and grinding discontinued. An end product with improved appearance—better product appeal.

Stampings . . . Unitize Construction, Replace Inaccurate Stainless Steel Spinnings

Original contruction of bulk milk cooler used tank manhole cover spinning—requiring welding, grinding and polishing.

Problem: reduce production finishing time, overcome welding heat distortion of stressed metal-spinnings, increase strength, produce uniform parts and improve sanitation properties.

Solution: COMMERCIAL's "die bank" proved a nucleus for a one-piece stamping redesign including integral handles. Basic stamping details—size, shape and gauge were tailored to stock die components. Realization—smoother finish of stamping creates a more sanitary, better appearing tank. Closer tolerances of stamped cover provide flange with definite "drop-on" vacuum seal. Fewer parts resulting from stamping. Unitization greatly diminishes production time and component cost.

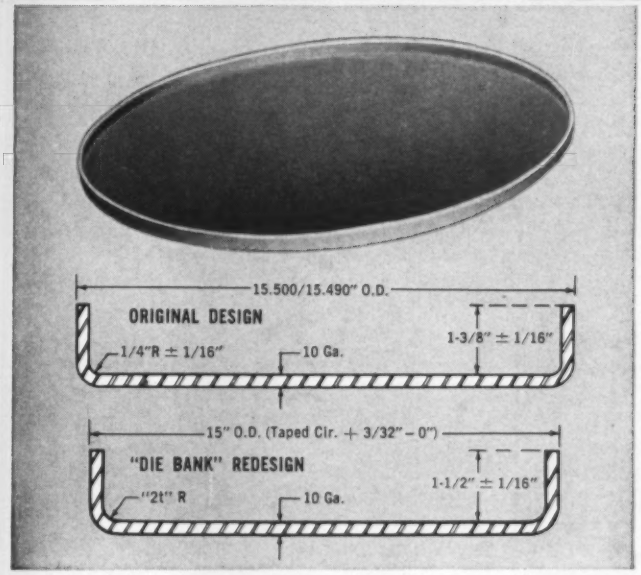
"Die Bank" Facts

Over 50,000 stock die components stand ready to go to work for you at COMMERCIAL. These components can be combined in endless variety—can prove, as they have for others, invaluable in your stamping design.

Components for circular stampings cover a diameter range from 2½" to 72". To 30" O.D., increments are in units of 1". Over 30" O.D., increments progress from 1" up to 6" for the largest diameter. Under 24" O.D., many sizes are available in fractional inches.

Stampings from these die components range from 20 gauge to ¾" thick. Contour can be flat or dished to any one of many patterns. Stampings can be supplied with vertical, horizontal or reverse flanges—or without any flange.

Use of COMMERCIAL's "die bank" results in many stampings made to basic original design free of heavy tooling cost—minor design latitude often eliminates all die expense. Catalog 200-C1 "Standard Metal Shapes" should be in your hands when preliminary designs go on the board.



"Die Bank" Stamping Gets O. K. . . .
Reduces Cost of Tailored Design

Original design of agriculture combine cylinder head called for odd fractional dimensions. Tolerances were tighter than necessary and applied in conflict with best stamping practice. Details were established without knowledge of COMMERCIAL's "die bank". Result—high unit cost to produce basic part to individually tailored size. Special dies, not in existence, were required.

Problem: redesign a more practical part to be mass produced at low unit-cost—eliminate special die cost.

Solution: simple redesign using stock die components from COMMERCIAL's "die bank" cancelled out $1850 partial die cost required for tooling original design. Net die cost: zero. Piece price reduced: 16 cents. Savings on initial requirement: over $2200. A stamping made to commonly accepted tolerances at lower cost without sacrificing product quality was the answer.

Advantages of Stampings

Economy of production
—metal conservation, waste material minimized, stamped parts have greater surface area than blank the part is made from—without loss in strength
—high quantity man-hour output from fast production machines—low unit cost

Greater strength: predicted, controlled, unvarying
—higher proportionately, in relation to weight, than possible in other metalworking processes

Enhanced appearance: finish is predictable, uniform, "as specified"
—multiple selection of basic material and its finish facilitates maintaining appearance in stamping the part or its further processing

Features of COMMERCIAL Stampings

Specialized equipment
—modern presses with capacity over 2000 tons; facilities located in three strategic metal producing centers

Economical large or small runs
—medium to heavy, shallow or deep drawn stampings

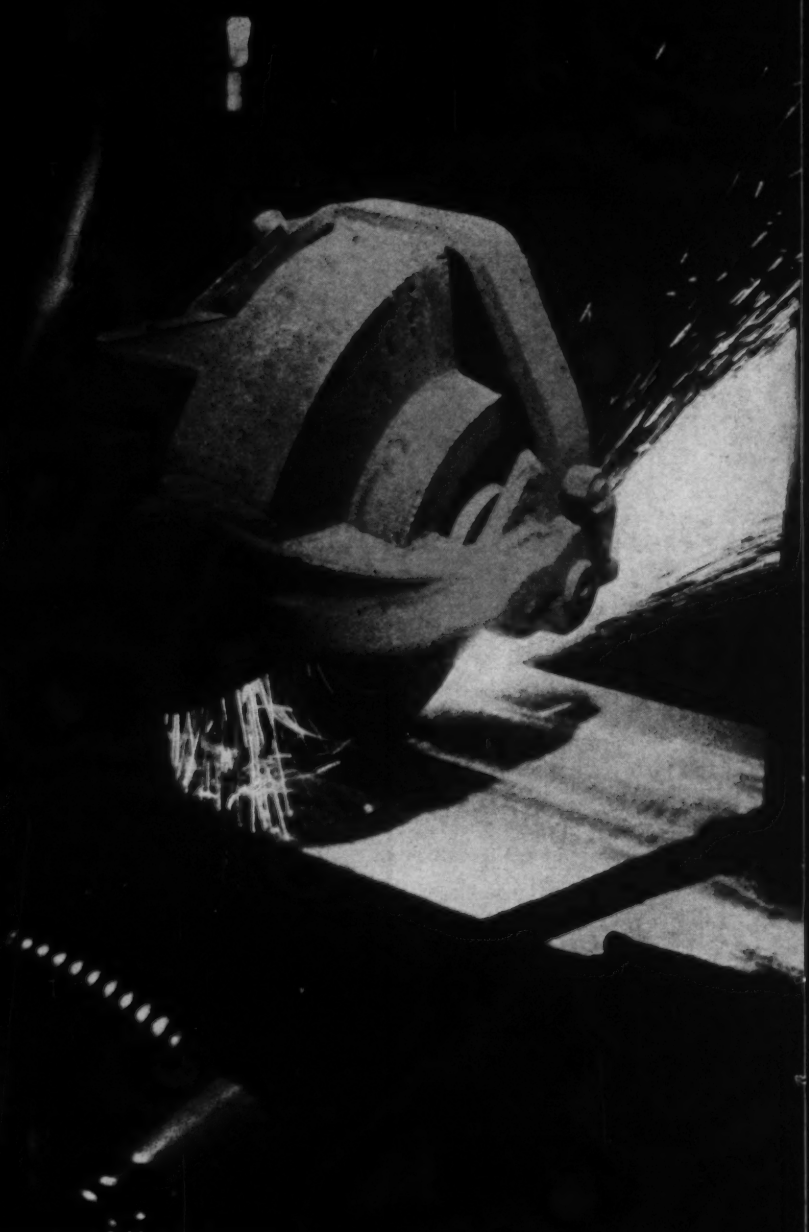
Facilities for finishing
—drilling, boring, tapping, machine trimming, burning, welding, painting, etc.

While designs are on the board, or redesign of parts in usage are fresh in mind, why not call on COMMERCIAL'S technical service—send print, sketch, sample or prototype. Address: Commercial Shearing & Stamping Company, Dept. K-42, Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping

NEW DEVELOPMENT IN

RESINOID WHEELS for BILLET GRINDING



CUT COSTS UP TO 30%

- Especially developed for stainless and special alloy steels.
- Combine new high-strength grain with new bonding technique for dependable results.
- Operate at high head pressures on conventional mechanical grinders.
- Outperform and outlast wheels now in general use.
- Reduce overall grinding costs.
- Performance-proved in leading steel mills.

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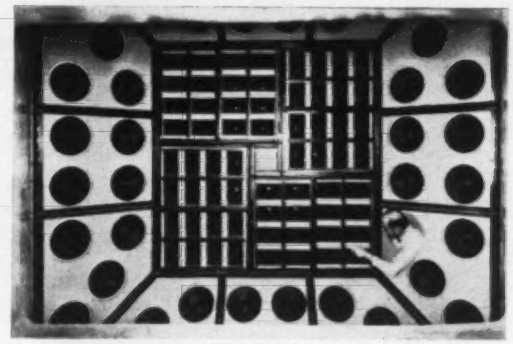
Sounds Out Weak Spots

Sound is used to prove the reliability of modern aircraft and missile parts. This giant hi-fi set duplicates the awesome sound vibrations that can damage or even mutilate a piece of steel. The sound test chamber is part of an environmental-testing facility established by Goodyear. The unit will solve problems posed by the hypersonic speeds of today's aircraft and missiles.



TWEETERS AND WOOFERS: Mutilate metal.

Bearings Float On Air

How can you get a bearing to duplicate the weightless operating conditions of outer space? Researchers at Industrial Tectonics, Inc. point to their new air bearings. The bearing socket has a number of vents. When air pressure is supplied, the sphere floats on it to eliminate friction. Sphericity of bearings up to 12 in. in diameter can be held to 0.000050 in. with a 4-microinch surface finish. The bearings will be used on satellite simulators.

Most Likely To Succeed

Syncom, the communications satellite to be orbited within a year, shapes up as the most likely system to succeed. Syncom is short for synchronous communications. It means that the satellite will match the earth's speed, therefore appearing motionless in the sky. Three such satellites could provide almost worldwide communications, whereas other systems require many more.

Must Seal at -424°F

NASA's Marshall Space Flight Center awarded a $68,500 contract to Hughes Aircraft Co. for the development of a rubbery sealant for use with supercold liquid propellants. There is no known sealant material adaptable to the temperatures of liquid rocket fuels, the coldest of which is -424°F. The new compound is expected to harden, but not turn brittle, during low-temperature use.

What Do the Experts Say?

The "Space Report To The Nation," put on in New York by the American Rocket Society, brought this news from America's leading space experts—

1. Proposals have been made to establish manned outposts on the moon by blasting large chambers under the moon's surface with explosives.
2. Disclosure that all of the Nation's advanced space-flight systems face problems due to a one-year lag of materials behind design requirements.
3. A cesium-ion engine, which may send a manned spacecraft to Mars in the future, is scheduled for its first test in space next year.

'Maddam' Chases Targets

A completely-miniaturized electronic computer, about the size of a loaf of bread, has been developed by Burroughs Corp. The single-purpose brain was demonstrated as it might be used by the military—to solve a target chase-and-catch problem from an airplane, spacecraft or missile. Called Maddam, (derived from macro-module and digital differential analyzer machine), the computer can perform 33,000 jobs per/second.

Plans Larger Rockets

Big rockets, about the size of the Washington monument, are getting more attention. Space experts wish they could stay away from the giants. But, unless U. S. scientists tame nuclear power for rockets, the big boys will have to be built. One plan calls for rockets weighing up to 100 million lb and standing 664-ft tall. Dr. Wernher Von Braun says the U. S. is considering final development of Nova, which is to be 400-ft high. Saturn, standing 162-ft, is ready for a flight test.

Portable Power Source

Readily-portable power for remote-area or space exploration is under development utilizing thermionic systems. One such electric power-generating unit would be small enough to be carried in a one-man knapsack.

USS Higher strength steels make more sense for this rugged, light-weight trailer

(It carries 1100 pounds more)

Here is a high-capacity dump body trailer that gives you a substantial dead weight reduction for only a few cents per pound of payload increase!

This trailer, which went into service in January, 1961, hauling both hot and cold slag, is proof that each pound of payload increase you buy can cost as little as 35¢ per pound.

To prove our point, this 27-cubic-yard trailer was created by the TEC Division of the Heil Company, Cleveland, Ohio, in conjunction with the Applied Research Laboratory of United States Steel. Using the USS Family of Steels—carbon steel, USS COR-TEN High-Strength Low-Alloy Steel (50,000 psi minimum yield point) and USS "T-1" Constructional Alloy Steel (100,000 psi minimum yield strength)—compared to a similar capacity carbon steel trailer, we were able to reduce the weight of this one by 1100 pounds—at a cost of only *35¢ for each one of the 1100 pounds.*

This was done by using 14-gage USS COR-TEN Steel for trailer body sides, 12-gage in the floor, and USS "T-1" Steel in the high-strength, lighter weight draft arms.

As a bonus, both USS COR-TEN and "T-1" Steels give you four to six times the atmospheric corrosion resistance of carbon steel. You also get high resistance to abrasion and impact. USS COR-TEN holds paints considerably longer than ordinary carbon steel.

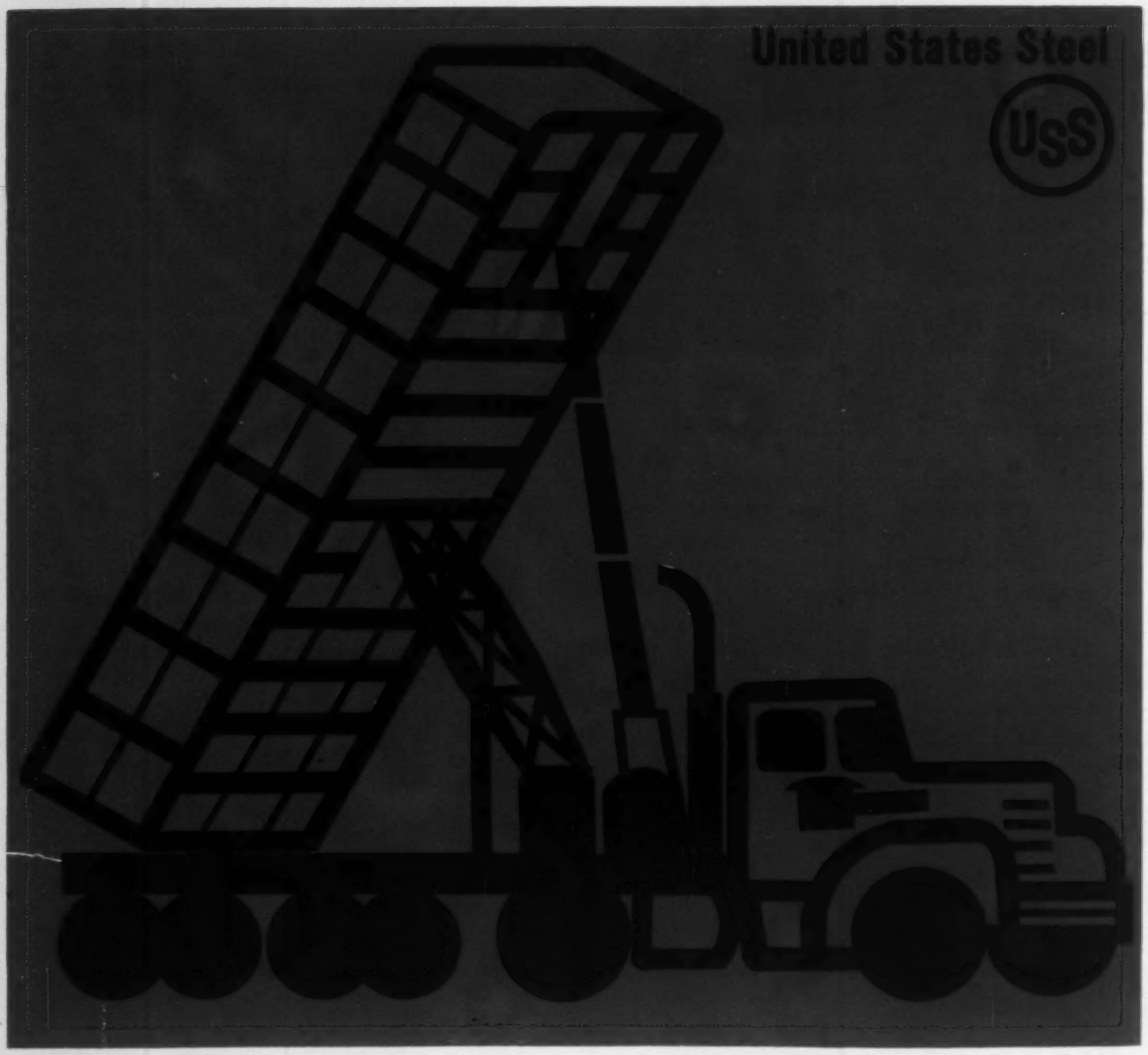
In other words, pound for pound, higher strength steels have yet to be equalled by any other material of construction when you consider strength, endurance and cost.

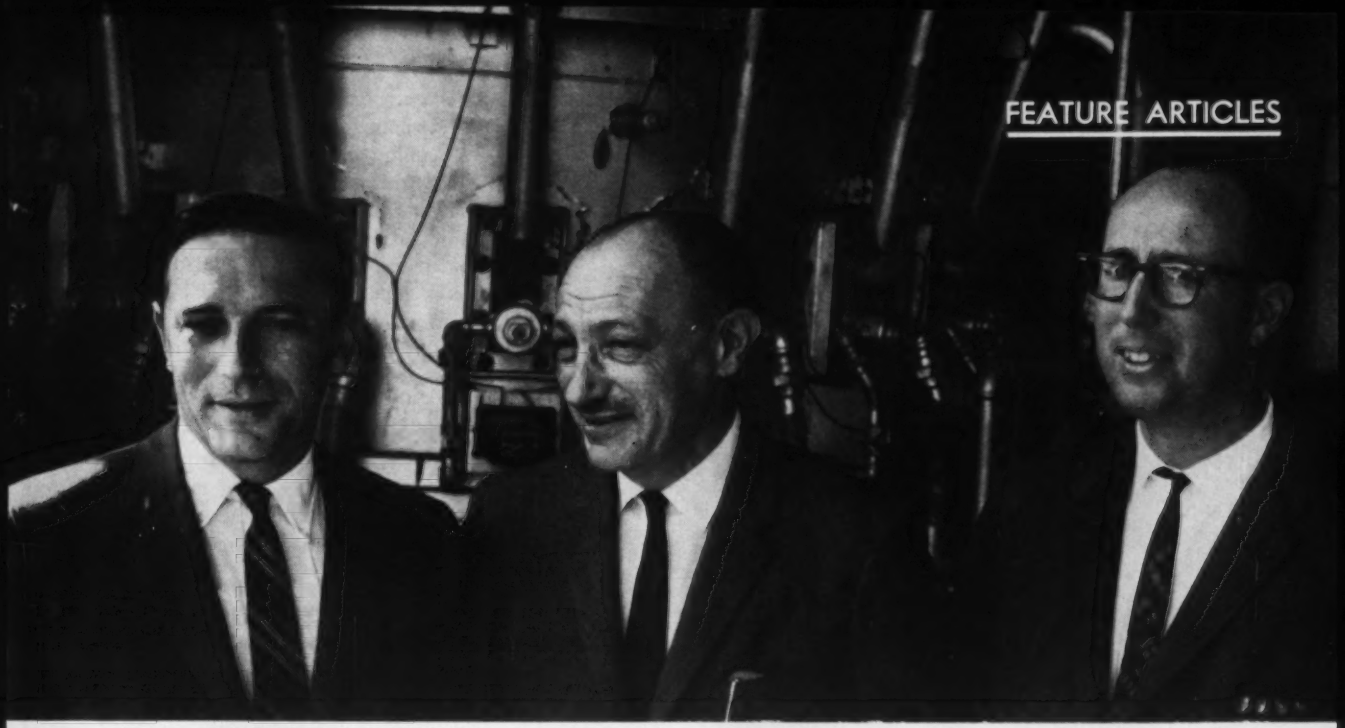
The tremendous success of this model has led to the design of a similar steel trailer that will lop off still another 400 pounds of dead weight (9100 lbs. tare). For more information about USS "T-1" Constructional Alloy or our various grades of high strength steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. USS, COR-TEN and "T-1" are registered trademarks.

United States Steel Corporation
Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

This mark tells you a product is made of modern, dependable Steel.

This new frameless steel trailer built with USS COR-TEN and "T-1" Steels easily withstood a punishing seven-month service test hauling 23,000 tons of hot and cold slag and is ready for several more years of gruelling work. Operator: Hawkins Contracting Company, Pittsburgh, Pennsylvania.





HEAD DEVELOPMENT TEAM: J. A. Bauscher of Lee Wilson Engineering, Inc., and G. A. Samuel and J. V. Bell of Alloy Surfaces Co., Inc., head studies on chromium alloying of steel with open-coil process.

Open-Coil Process Makes Bid For Stainless Market

The open-coil process is taking on a new role.

Instead of removing unwanted elements from steel coils, it's being used to add certain ones.

One result: A new low-cost "stainless steel."

■ Low-cost sheet metal with the heat and corrosion resistance of stainless steel has been the goal of industry for many years.

Recent advances in the Lee Wilson open-coil technique coupled with improvements in the Alphatizing process now make it possible to uniformly diffuse chromium into coiled steel.

Result: Coiled stock competitive with certain grades of stainless steel. Applications will range from automotive trim to mufflers and furnace parts.

Sizes Go Up—Current tests are on 3000-lb coils. But, it's expected that full-size coils of Alphatized steel in weights up to 20,000 lb will soon become available commercially. Price? Considerably lower than that of stainless steel in the same gage, says Gasalloy Steel Corp., Wilmington, Del., developer of the process.

Test coils are now being sold to potential users at an arbitrary price of 28¢ per lb. As the process is scaled up, Gasalloy Steel expects that a 20-24¢ price range is well within reach.

Gasalloy Steel Corp. combines the technical know-how of both Alloy Surfaces Co. Inc., Wilmington, Del., a division of Reeves Soundcraft Inc. and Lee Wilson Engineering, Inc., Cleveland. Officers of the newly formed company are drawn from the ranks of the parent companies.

They are: C. F. Olmstead, chairman of the board, A. J. Seiler, president, J. A. Bauscher, vice president and treasurer, and H. W. Clapper, secretary.

What's Alphatizing? — Alphatizing, invented by Alloy Surfaces, G. A. Samuel and J. V. Bell, involves the diffusion of chromium into the surface of steel to form a metallurgical alloy or "surface cladding" which has the traits of stainless (IA —Feb. 11 '60, p. 143). Alphatizing derives its name from the stabilizing effect of chromium on alpha iron.

The chromium-rich alloy on the

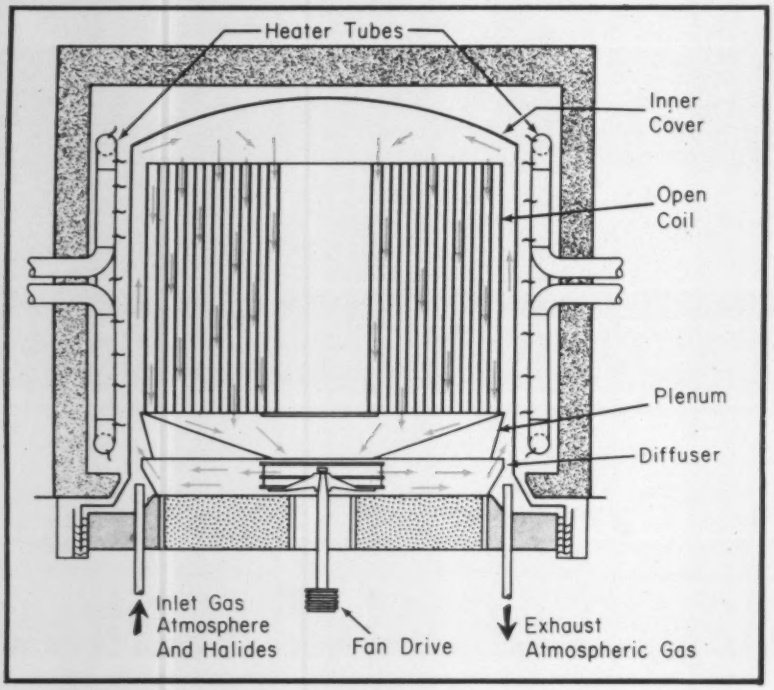
surface is not a coating or plating in the usual sense and does not flake or peel off. One example is a truck muffler with Alphatized components which lasted 500,000 engine miles with no adverse effects.

Gains Fame—Originally developed for the rapid and uniform annealing of coiled steel, Lee Wilson's open-coil process leaped into prominence within the last two years when it was learned that it can also be used to remove carbon and nitrogen from coiled stock. Some results: one-coat enameling steel, non-aging rimmed steel.

Teaming up the two processes, Alphatizing and the "open coil," seemed a logical step to officers of Alloy Surfaces and Lee Wilson. The treated coils, they felt, would represent a much needed material with an attractive price.

Pilot-plant studies are being made in a single-stack furnace capable of annealing open coils 78 in. diam and 48 in. wide. Some modifications were made in the furnace to permit Alphatizing—modifications that can be made in many of the existing open-coil annealing furnaces.

Gas Takes Open Coil Route



UP AND AROUND: Chromium-containing gas passes up outside of the coil and down through the opened wraps. Result: A "stainless steel."

Opens The Coil—Narrow, corrugated steel straps or "twist-over" wires hold the individual wraps of coiled steel in place; they are wound into the coil at its top and bottom edges during the open coiling operation.

High-speed fans circulate chromium-halogen-containing gases at 20,000 cfm within the inner cover and down through the spaces of the opened coil. In current development work, cycles run 5-12 hours.

One key feature of the process is the low temperature used which permits thin gages to be Alphatized without significant sagging or distortion.

Range of Activity—"Most applications will center on low-carbon steel—either rimmed or aluminum-killed," says J. V. Bell, vice president, research and development, Alloy Surfaces. "But, if desired, the process can be used to Alphatize coils of low-alloy steels also.

"Current work is being done on 20, 18, and 16 gage rimmed steel. However, there's no technical reason why we can't operate within a range of 22-13 gage," adds Mr. Bell. "For that matter, we plan to work with coils wider than 36 in. also."

Case Is Ductile—Alphatized steel has a soft ductile case about 0.001-0.0015 in. deep on each side, with an average chromium content of about 23 pct.

In one test coil, 36 in. wide and

Steel Shows "Stainless" Traits

Time, hours	Alphatized mild-steel sample, g*	Increase in weight, pct
0	67.1	0
34	67.1	0
134	67.3	0.3
182	67.3	0.3
280	67.3	0.3
380	67.3	0.3
460	67.3	0.3
561	67.3	0.3
661	67.3	0.3
762	67.8	1.0
860	67.9	1.2
961	68.3	1.8**

* 0.55 in. thick. Edges sheared after Alphatizing. Tested at 1400° F in still air.
** Ductile sample, (180° bend) after exposure.

weighing 3000 lb, the spacing between wraps was held at 0.18 in. Yet the coil shows uniform penetration of chromium from top to bottom and from end to end.

How About Properties?—Tensile strength is 35,000 psi; yield strength is 13,000 psi; elongation in 2 in. is 40 pct; ASTM grain size is 3-4.

Studies to date, add Gasalloy engineers, indicate that Alphatized sheet metal is virtually non-aging; no coil breaks develop during the recoiling operation.

The surface finish of the treated coil is essentially that of the starting material since nothing contacts the steel surface except the treating gases. Buffing will develop a high luster on the treated coil stock; cold reducing will improve the surface appearance while enhancing physical properties.

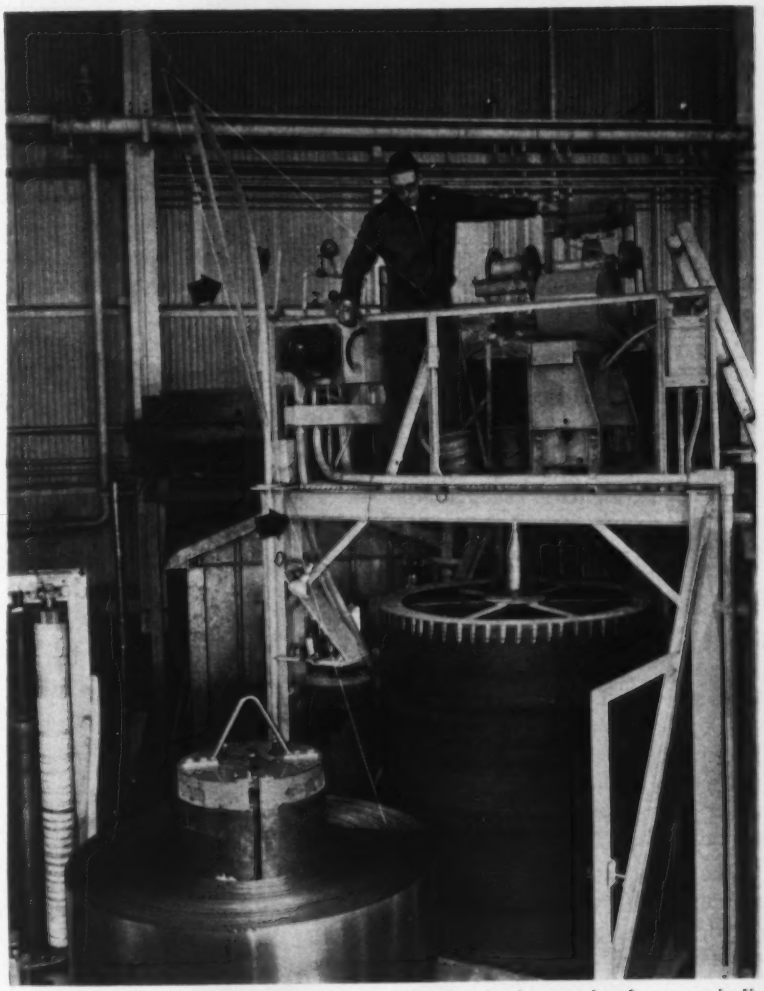
Top Weldability—Olsen cupping values of the treated steel range from 0.40-0.47 in. This is equivalent to the drawing qualities of commercial grade low-carbon steel.

One of the most interesting properties of Alphatized steel is the ability of the chromium-rich case to take spot welding. There's no surface burn-through or interruption in case continuity. Also, there's no breakdown of the case structure when using filler-metal arc welding.

Heat Resistance Is High—Alphatized steel has found considerable commercial use in high temperature jobs, particularly in the 600°-1400°F range. The table points up the excellent oxidation resistance of this material. Note that the sample was tested with its edges sheared after Alphatizing. This demonstrates the stability of the case structure even in those areas where an iron oxide bead forms.

Considerable data have been gathered over the years as to the outstanding performance of Alphatized mufflers mounted on gasoline-powered trucks.

Autos Next—Now, a number of car-muffler manufacturers are evaluating Alphatized mufflers in actual field tests.



OPEN COIL REMAINS: Vital to gas alloying is the spacing between individual wraps of coil. Here, nylon spacer is removed after coiling.

T. A. Danner, engineering vice president of Arvin Industries' Automotive Div. reports that Alphatized car mufflers are still holding up very well after two years of field testing.

Arvin is also evaluating the feasibility of making tubing from Alphatized coil stock on an automatic tube mill. Initial tests indicate that forming and welding of a test coil into tubing proceeds normally.

Mr. Danner feels that the availability to industry of Alphatized coils, may well permit the widespread use of a reasonably priced passenger car muffler with corrosion resistance comparable to Type 430 stainless.

Licensing Aspects — Gasalloy Steel Corp. holds an exclusive license from both companies for the further development and commercialization of Alphatizing as applied to open coils. Ultimately it will offer the process on a licensee basis to producers of sheet steel.

The Alphatizing process is already licensed to a number of companies who are using it to treat items such as relay components, strip heater casings, rubber tire stripping burrs and special tooling.

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 223**

Welding Research Paves Way For Thick Joints in Titanium

One of the wonder metals of this century, titanium, may be in for some unusual applications in the years ahead.

Crack-free welds can now be made in heavy plate alloys.

■ Titanium hulls for submarines may be a future project. This possibility comes on the heels of the announcement that 2-in. thick titanium-alloy plate can be welded without cracking.

Research engineers at Battelle Memorial Institute reported this development at the recent National Fall Meeting of the American Welding Society in Dallas. The work was under the sponsorship of the Bureau of Naval Weapons.

The Navy had reasoned that a titanium hull would increase the speed, payload and diving depth of submarines. This reasoning was based on the lightweight, high-strength traits of the corrosion-resistant metal.

Previous attempts to weld even 5/8-in. thick titanium plate had resulted in cracking. According to Battelle researchers W. J. Lewis, G. E. Faulkner and P. J. Rieppel, the cracking problem can be eliminated by providing adequate shielding. On the 2-in. thick sections, all welding was done inside an argon-purged chamber.

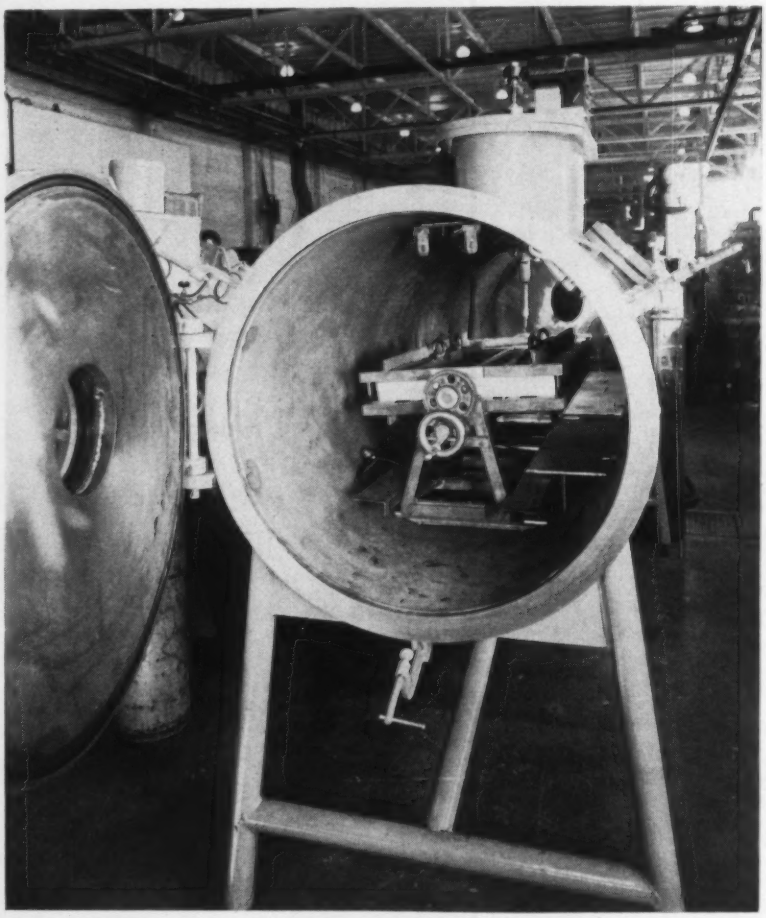
Four Alloys—Studies were made on four different titanium alloys. All welding was done automatically using the consumable electrode process. Filler wires were 1/16 in. diam. Welding conditions of 365 amp, 32 v and 15 ipm travel speed were maintained to produce heat input of about 45,000 joules per inch.

Aside from the fact that titanium of such thickness had not been known to have been welded before, a successful weld had to meet certain requirements. In yield strength, the weld metal had to match, if not exceed, that of the base metal. The same was also true for impact properties.

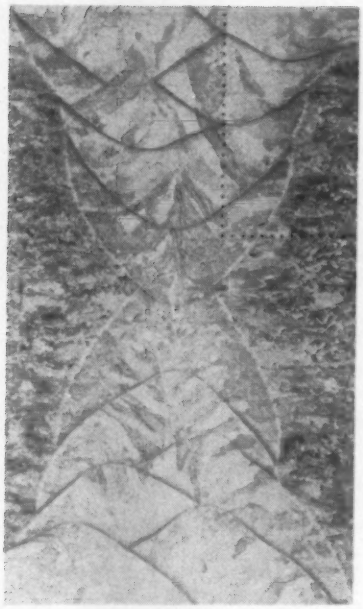
What was the most ideal weldable combination of filler metal and base plate? The commercially available Ti-6A1-4V plate, when welded with the experimental Ti-5A1-2Cb-1Ta filler metal, produced the best results.

Best Properties — Here, yield strength was recorded at 104,000 psi, while notch toughness at —80°F was 40 ft-lb. The requirement called for yield strengths in that range and a notch toughness of at least 20 ft-lb at the —80° temperature level.

Proof that cracking could be eliminated through adequate shielding was determined by subjecting



ADEQUATE SHIELDING: The problem of weld cracking is eliminated by welding 2-in. thick titanium plates inside an argon-purged chamber.



SOUND WELD: Plate and filler in this case are both Ti-6A1-4V alloy. Titanium plate is 2 in. thick.

the weld metal to two restraint tests, both the Lehigh and Naval Research Laboratory cracking restraint tests. No cracking occurred. Multipass welds on the four alloys produced no signs of cracking either.

The Battelle engineers note that plates with even better strength and impact properties are quite possible. This can be done by making slight changes in the composition of both plate and filler alloys.

Two other alloys, Ti-5A1-2.5Sn and Ti-13V-11Cr-3Al, also offered acceptable yield strengths. The latter alloy, however, had such low impact properties that no further studies were made.

Watch the Oxygen—The impact properties of the other alloys could be improved if the oxygen contents were reduced. The practical oxygen limit for plate materials is about 0.07 pct.

To obtain satisfactory impact properties in the weld metal, several experimental filler wires were developed to weld the Ti-6Al-4V alloys. The experimental alloys were arc melted at Battelle and rolled to sheet. Filler was sheared from sheet and deposited by hand in 1/2- and 1-in. thick plates.

The first filler wire, a 6-pct aluminum alloy, produced a weld composed of only 0.0415 pct oxygen. This level was far less than that obtained by commercial wires. However, the yield strength of the weld metal was only 110,000 psi, slightly under the objective. Acceptable impact properties were noted.

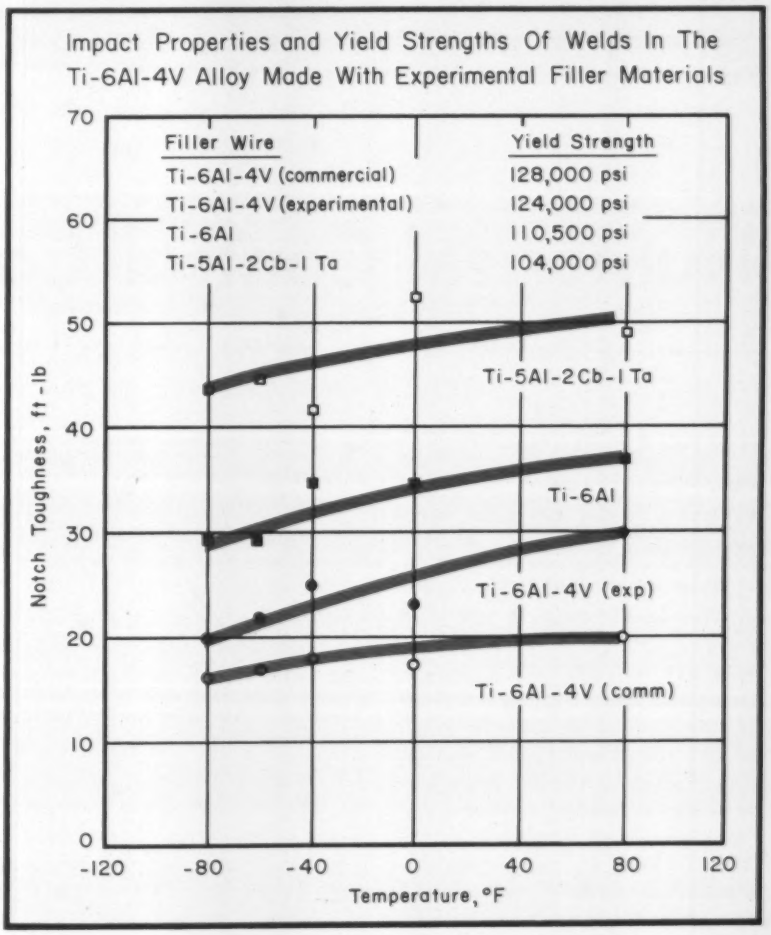
Number One—The most successful experimental filler wire was the Ti-5A1-2Cb-1Ta type. This wire produced welds with the best impact properties. At room temperature, toughness was 50 ft-lb and at —80°F over 40 ft-lb. The yield strength of these welds was just under the 120,000 psi requirements.

The yield strength was still very high considering the high impact properties. With higher aluminum content, the tensile properties probably would meet this requirement.

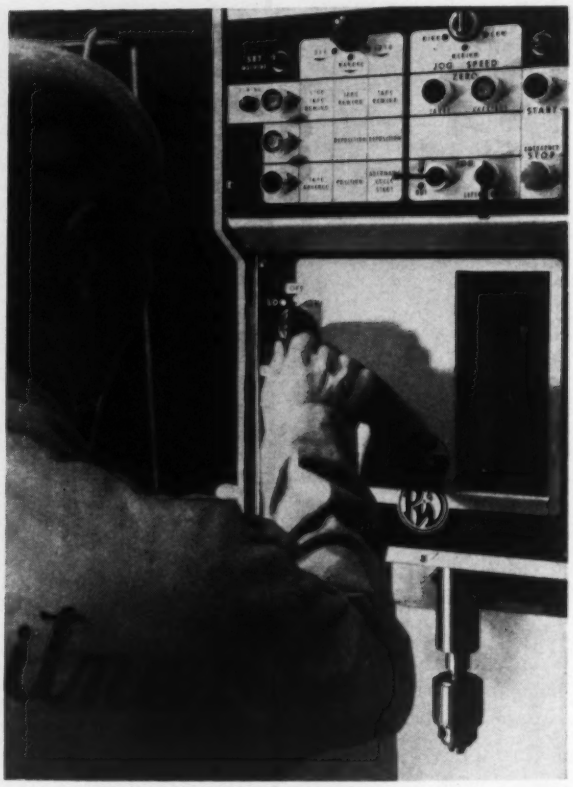
Not So Tough—The third experimental filler wire, Ti-6A1-4V, also revealed a low oxygen level, 0.0785 pct. Its yield strength was 124,000 psi. Its impact properties, however, were 20 ft-lb at the —80°F. A similar commercial wire had yield strength of 128,000 psi, but it fell below the 20 ft-lb limit in notch toughness.

The weld made by the 5A1-2Cb-1Ta alloy contained 5.52 pct Al, 0.25 pct V, 1.94 pct Cb, and low hydrogen and oxygen.

Compare Filler Wire Results



NO COMPLEX JIGS: Operator inserts tape into built-in reader on low-cost numerically-controlled unit.



CONSTANT CHECKS: Fully-transistorized controls monitor and feed back all of the positional data.

Numerical-Control Costs Tumble

Mass Production Brings Down Cost of Tape-Controlled Drills

Don't confuse numerical control with "million-part" automation. Point - to - point numerical control is ideally suited for small and medium workruns.

What about costs? Mass production keeps them in line.

■ A new low-cost numerically-controlled drilling machine allows every metalworking shop, large or small, to gain the advantages of automation. Called the Tape-O-Matic, this newcomer replaces up to ten conventional drilling spindles.

P. N. Stanton, vice president—marketing at Pratt & Whitney Co., Inc., West Hartford, Conn., states: "We recognize industry's need to modernize production equipment. We also realize that the price of numerical control prohibits thousands of companies from replacing obsolete equipment—even though there's a desire to buy.

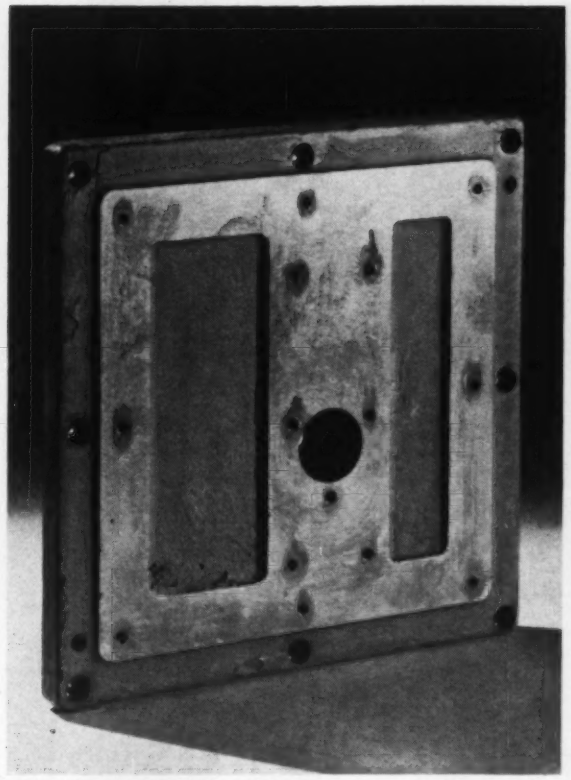
"However, we're so certain of numerical control's future that we took the daring step of introducing mass-production methods to the machine-tool industry."

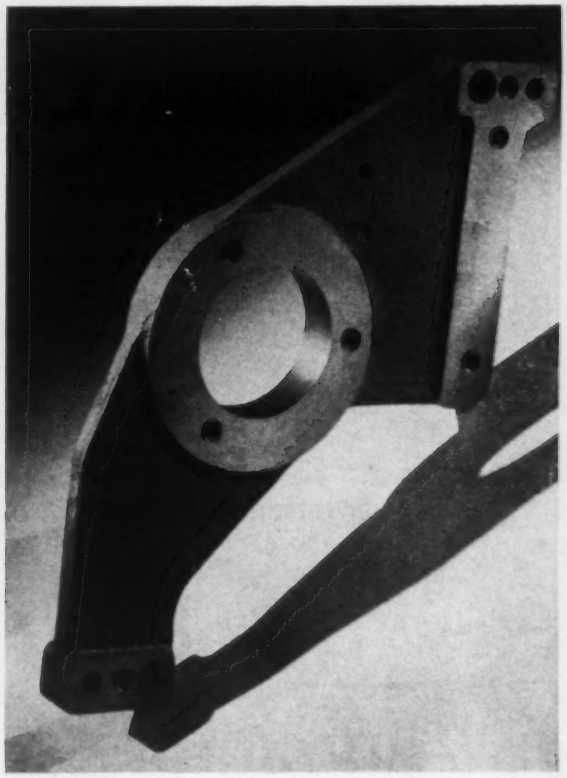
Offers Challenge — The result: N/C costs which even fit the pocketbook of small job shops. P&W's new drilling machine challenges foreign competition. It's reported to yield twice the value of the best equal-cost N/C drilling unit shown at the recent Brussel's Fair.

If the Tape-O-Matic doesn't reduce your drilling costs in 90 days, you get your money back. In addition, every unit carries a five-year warranty against defective parts and workmanship. These are firsts for any N/C machine tool.

D. C. McCarthy, P&W's executive vice president, reports: "Experience in our own plant proves the universal need for tape-controlled equipment. We operate about 30 N/C machine tools of all makes.

"Our files are full of case histories. They show the substantial savings in time and money realized





WHERE SAVINGS ACCRUE: Cast iron support bracket (left) is drilled on N/C machine without resorting to a $550 jig. The other part, a helipot drive bracket, is completed on the machine in 0.74 hours.

with numerical control. Once industry learns these full benefits, we'll have no problem selling all the Tape-O-Matic drills we can make."

One Spindle — P&W's low-cost unit is designed for mass production. It's perfectly functional. And it has no frills. With a 20- x 30-in. table, the Tape-O-Matic is a single-spindle drilling machine.

Transistors control the X and Y axes. They simultaneously position the table and the carriage. With a full floating zero, the transistorized controls monitor and feed back all of the positional data.

Simple holding fixtures secure each workpiece to the positioning table. You don't have to prepare costly jigs. Riser blocks and clamps fill the bill.

N/C drilling reduces floor-to-floor time by at least 30 pct. It also eliminates positioning errors. This, in turn, cuts rejects and scrap. Naturally, inspection efforts are eased. And you can measure the lead time on a complex job in days or weeks instead of months.

Positive Proof—Let's check out Tape-O-Matic costs versus conventional drilling expenses. As a case in point, consider a helipot drive bracket. First, we'll run through P&W's original production method.

Since output is small, these brackets were set up on a big borer. Thirty-three holes of various sizes were then spotted for follow-up drilling. Next, every part was loaded on a sensitive drill. Thus, it took 1.16 hours to complete each of these helipot drive brackets.

Now, N/C drilling completes each bracket in only 0.74 hours. Here's how. A programmed tape replaces the jig borer. It automatically positions the drilling spindle to precision tolerances.

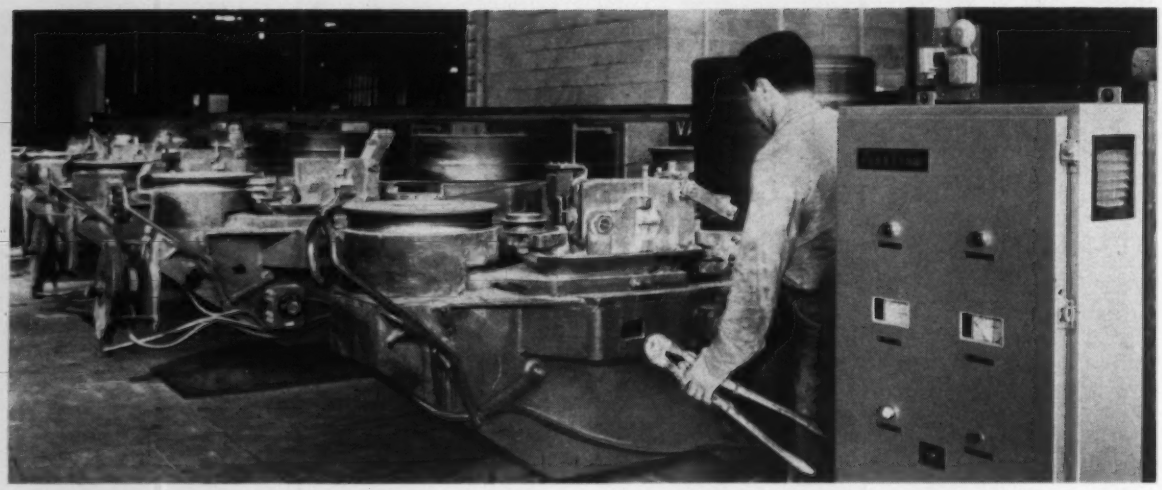
Repeatability—Of course it takes time to prepare the tape—1.1 hours to be exact. But once the tape is cut, you're sure of perfect positioning with every part.

What does this mean in dollars? Let's assume an average prorated-hourly cost of $10. Total savings on a 15-part workrun amount to $63. If your shop has 250 such jobs per year, N/C drilling can save $15,750. This means you could pay for the Tape-O-Matic in six months.

Time Consuming—Cast iron support brackets provide another example of potential savings through point-to-point numerical control. Previously, precision with these complex parts hinged on a costly drilling jig and about two hours set-up time per part.

On short workruns, averaging 13 parts, it took almost three hours to finish each part.

When P&W switched to tape-controlled drilling, the preparation time dropped to less than a half hour per bracket. The company now saves $421 on each 13-part workrun.



WAITING FOR THE BELL: When the bell sounds, the operator cuts the welded section out of the wire.

Flaw Detector Pinpoints Welds In Aluminum-Covered Wires

In continuous wire-drawing lines, butt welds are a must.

However, they have to be cut out of the finished coils. This isn't easy, when the wire moves at 1000-fpm rates.

By **W. N. Redstreake**
Automation Editor

▪ Using modular-design concepts, an electronic flaw finder pinpoints welds in aluminum-covered steel wires. As these wires are drawn at 1000-fpm rates, the new test system monitors all weld locations. It's so sensitive it can even be set to detect tiny flaws and voids in the aluminum coatings.

The wire coils are butt welded together at the Copperweld Steel Co., Glassport, Pa. Welding allows the endless coils to be drawn through several dies in one operation.

From a metallurgical viewpoint, every weld area is undesirable. It must be cut out of the finished product. First, of course, you've got to find the weld.

Where'd It Go? — Previously, Copperweld's shop people marked all weld areas with a colored dye. Weld locations were remarked several times as the wire was drawn at speeds in excess of 1000 fpm. Naturally, this hit-or-miss system left much to be desired.

All of the butt-welded areas are now spotted positively by Flux-Flaw equipment. This electronic equipment, made by Assembly Products, Inc., Chesterland, O., can also serve on sheet- and tube-forming lines.

Flux-Flaw employs some new concepts in the detection of discontinuities. Especially noteworthy is its ability to distinguish between the type of flaw it's seeking and other phenomena that cause unwanted signals or "noise" effects.

Everyone's Happy — Has the equipment proved a success at Copperweld? Here's positive proof. Four days after the unit was installed, the company ordered three more Flux-Flaw detector systems.

Mr. L. C. Whitney, Copperweld's manager of development engineering, states: "It's hard to gage the potential savings that will result from using this equipment."

Temporary butt welds are a must in continuous wire-drawing operations. Mr. Whitney adds: "These welds must be located and cut out of the finished wire. Flux-Flaw saves inspection time. And, even more important, it insures optimum quality."

Direct Current—The new system uses direct-current excitation with an induction process to detect magnetic flaws in the steel. These tiny flaws alter the magnetic field which surrounds the wire.

Conventional eddy currents, commonly used in flaw detectors, can't handle this under-cover problem. Why? Because eddy currents can't distinguish between welds and tiny

voids in the wire itself.

The eddy-current principle hinges on alternating-current field excitation. Copperweld tried this method. Mr. Whitney says he can't use eddy currents because the wire absorbs the alternating currents.

Old and New—Flux-Flaw uses several novel variations of common magnetic-field methods. In all such systems, an electrical current excites a coil and sets up a magnetic field around it. Flaws entering the magnetic field cause signal changes in the field.

Now, let's see how the new unit differs from normal test setups. Most flaw detectors compare signal changes with a synthetic signal that is set up to reflect a preselected "normal" condition.

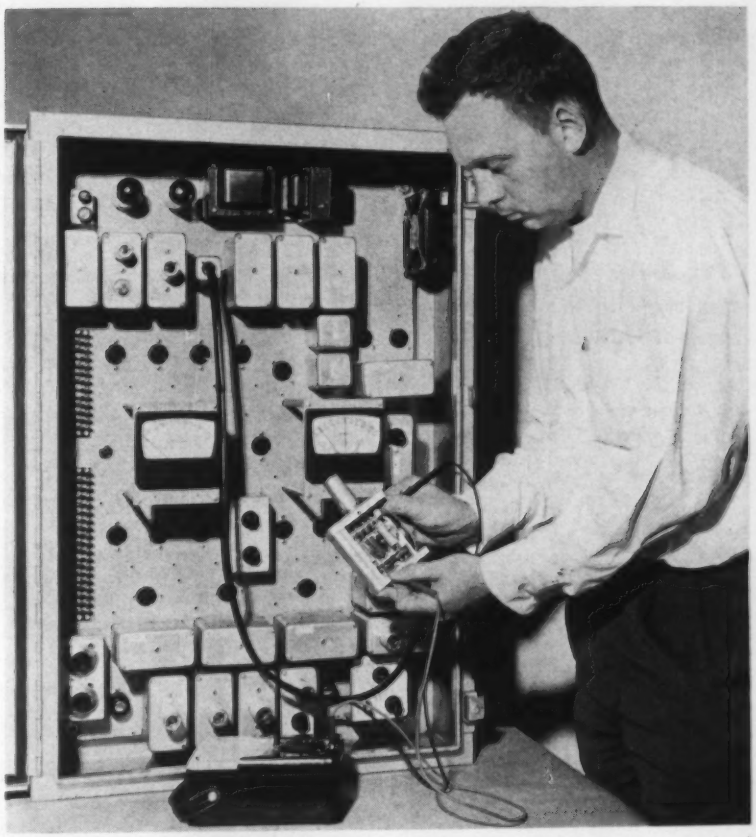
Flux-Flaw makes its comparisons with actual conditions on the material that's being tested. Thus, abnormal movements of the material don't affect the read-out signals.

Positive Signals — The signal pickup is located at the coiling end of the line. Just before the wire is coiled, it passes through a multistage transducer. When a weld is detected, this transducer triggers an electrical or an audio control.

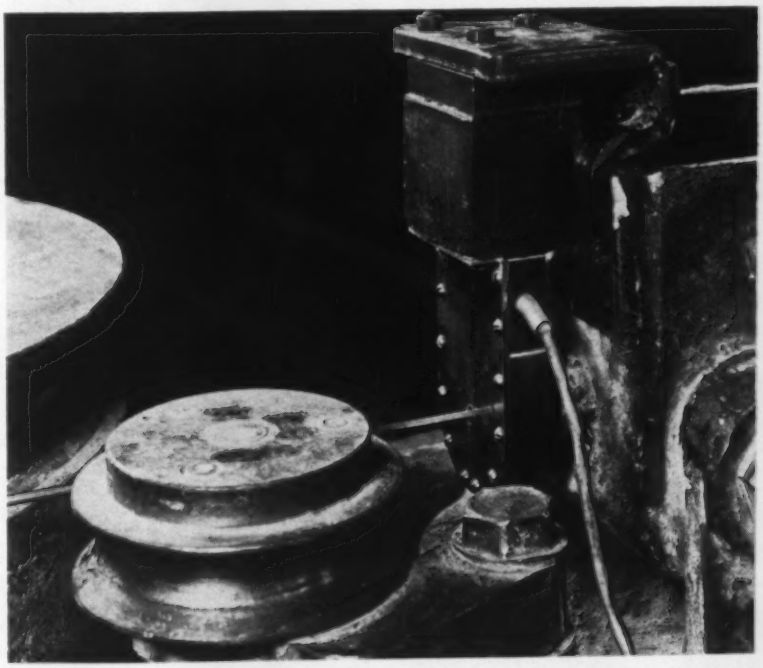
Each transducer contains both pickup and excitation coils. Whenever the magnetic field is changed, a voltage is induced into the pickup coil. This voltage is proportional to the rate of change in the magnetic field's condition.

Since a magnetic discontinuity reaches one coil before the other, signals with a time differential come from the pickup coil. Both coils monitor noise signals at the same time. Next, the coil signals are automatically compared. Their difference yields a useable weld-detection signal.

During the checkout period at Copperweld, final signals actuated an alarm bell. Eventually, this audio alarm will be scrapped. Then the signals will be used to stop the line—until a weld is cut out.



MODULAR CONCEPT: Replaceable electronic modules can be serviced or replaced without removing the cabinet from its permanent location.



HEART OF THE SYSTEM: Transducer creates a steady direct-current magnetic field. Discontinuities in the welds affect this magnetic field.

How Coremaking Puts Precision Into New Cast Iron Engine

Foundry techniques play a vital role in trimming weight from castings.

Taking credit for Ford Motor Co.'s lightweight, cast iron engine is a new coremaking process.

▪ With the trend to lighter-weight engines that pack more horsepower per pound, product and manufacturing engineers have been caught in a dilemma: How to reduce vehicle operating cost, and improve performance while at the same time to trim manufacturing cost?

Cuts Engine Weight—Ford Motor Co. has pioneered new casting techniques for many years. Recently developed by the Engine and Foundry Div., for example, is a precision-molding method that cuts the weight of cast-iron components in engines.

This process gives greater precision and uniformity when casting heads and engine-block walls, according to Ford. It reduces the need for compensating for core shifting during pouring.

As a result it's possible for engine designers to specify thinner walls — giving them much greater design freedom.

New Aspects—Several developments make possible this improved accuracy in casting gray iron, points out A. M. Clark of Ford's Engine and Foundry Div.

First is the use of a new resin binder with foundry-core sand. Result: Highly accurate cores for making the intricate internal shapes required in modern overhead valve engines.

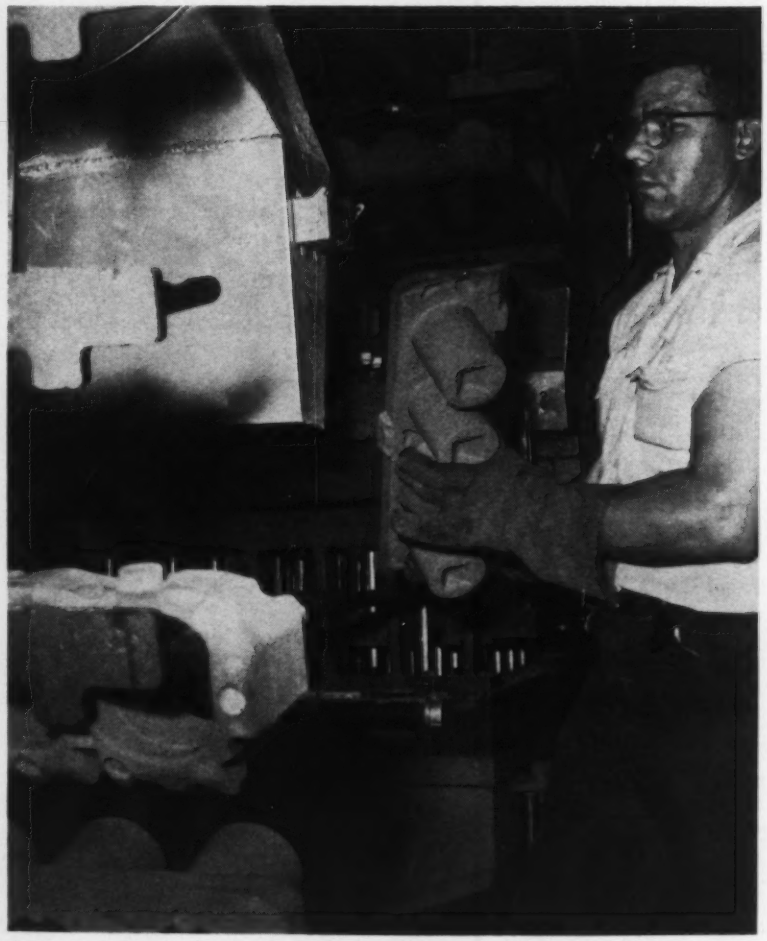
"A related development is use of preheated core boxes. These quick-cure the core-sand mixture much faster than before," says Mr. Clark. "Previous methods required extensive handling and baking of cores. There were many chances for distortion."

Another advance is the use of higher-pressure molding. This produces a mold of both greater hardness and more uniformity.

Why Use Cast Iron? — Since World War II, Ford has built and evaluated many light-alloy engine blocks. Research is continuing. But to date, the use of cast iron in cylinder blocks and heads has held many advantages.

The material is familiar to production people. It's easy to machine, withstands high temperatures, and has excellent sound—and vibration-dampening qualities.

Another point is that cast iron contains free graphite in its matrix.



NEW TECHNIQUE: Hard, dense cores, made by new technique, play vital role in the casting of Ford Motor Co.'s new cast-iron V8 engine.

Graphite is a natural lubricant, explains A. M. Clark. It also has a tendency to attract and hold minute particles of oil. This feature makes it ideal for engine parts.

Assures Proper Fit — Cast iron also has ideal thermal-expansion characteristics. This is an important engineering factor in assuring the proper fit between mating parts over a wide range of operating temperatures.

In the past, limitations of a casting process dictated casting thickness. In standard sand-casting techniques, because of dimensional variations inherent in the process, foundries have to make large allowances in part design. This is the only way to assure that a section is not too thin, too small nor too weak, Mr. Clark points out.

Ford's improved casting technology means that it is now able to reproduce more consistently the design and dimensions the product designer requires.

"Placing the exact amount of metal where we want it is what we mean by lightweight cast iron. In reality, we have a lighter-weight, higher-precision casting," says Mr. Clark.

Call on Experience—In developing this process, Ford took into account its experience in shell molding such parts as crankshafts and valves. The Engine and Foundry Div. has, for example, produced valves with as little as 0.003-0.007 in. finish stock on the stem diameter.

Extrapolating this experience showed the proper direction to take. The first step was adapting shell-molding practices to the making of sand cores.

Traditionally, cores have been made with a mixture of sand, cereal and a synthetic oil. Forming the core is by propelling sand into a metal cavity using air and high velocity. After removal from the metal cavity, it is then cured or baked about 5 hours in an oven. During this time the core may shrink, sag or crack; this affects

FINAL INSPECTION: Visible in lower half of mold before closing are the precise cores made with new core-sand binders and heated molds.

LIGHT AND RUGGED: Foundry workers assemble cores in cylinder-block mold. Combined with increased and more uniform mold hardness, the new cores contribute to engine's lightweight and rugged features.

NO OVENS NEEDED: Cores can withstand normal handling immediately after coremaking. There's no need to bake them in a separate oven.

both quality and size of the finished casting.

Replace With Resins—So borrowing from the shell-mold process, the Ford division applied the principle of thermosetting resins, rather than mixtures of oil and cereal, as bonding agents for the sand. Actually, the resin is a modified urea-formaldehyde type.

In connection with the thermosetting resins, the foundry also utilizes the principle of heating the metal core box or cavity into which the sand mixture is blown. This way the core takes the shape desired with much less chance for variation.

In practice the hot box is at a temperature of about 450°F; this step eliminates curing the core in an oven. The core sets like an epoxy resin in an exothermic reaction. It takes only about 20 to 30 seconds per cycle, depending on core thickness and other variables.

Cores Benefit—There's obviously much less handling involved. Also the cores are stronger and harder —about 550 psi tensile strength; standard ones are from 350-450 psi. So there's less damage as well as greater accuracy in the process. This advance alone affords more precise, thinner sections than ever possible previously, according to A. M. Clark.

"Maximum improvement in dimensional control, however, would be somewhat lost if we were forced to set those precision cores into the same old green-sand molds," says Mr. Clark.

"This, then, is our latest development: We have now found ways to improve methods for making green-sand molds into which the cores are placed."

New Squeeze Boards — Dimensional stability of the molds now approaches that of the cores. This step is relatively simple. Through a redesign of squeeze boards, it's possible to secure more uniform, and greater pressure. A further technique adopted is the use of hydraulic pressure in compacting the sand molds.

These measures mean that the foundry now ends up with a more uniform mold of greater hardness to match the improved cores. To a great extent these improvements eliminate sag and assure more positive core location. These, in turn, add up to far better precision in the process.

Improve Sand Surface—There's another advantage, adds Mr. Clark. Improved sand control, better compacting devices and the higher mold-making pressure provide better surfaces in the sand when making green-sand molds.

These improved sand surfaces form the exterior shape of the casting. They take the shape of the pattern with very little dimensional variation. By this combination of advances it's possible to produce gray-iron castings with walls under 0.180 in. thickness.

Higher-strength casting irons will match these forward strides in molds and cores. Looking to the future, then, Ford expects to produce further dramatic results in the way of weight savings, durability and reliability of cast components.

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Vibrations Shape Soviet Tools

Russia knows how to make a shaky situation pay dividends.

By giving cutting tools "the shakes" during grinding, Red toolmakers extend tool life.

■ Behind the Iron Curtain, ultrasonic vibrations serve many metalworking roles. High-frequency oscillations are commonly used to increase cutting-tool life. Now, the latest announcement on ultrasonics from the Soviets covers the use of vibrations in grinding cutting tools.

Recently, the Russians released some details on the results of oscillation on a cutter's life. In essence, the Russian tool experts reported:

"Low-intensity radial vibrations —applied directly to a cutting tool —increase tool life by as much as 400 pct. But intensities above 10 microns may cause excessive wear and premature breakage."

Of course, the use of oscillating devices on every tool can prove costly. Therefore, Soviet scientists have concentrated on finding a way to obtain longer cutting-tool life without mushrooming costs.

Easier Way?—Perhaps the solution hinges on applying high-frequency oscillations to the cutters while they're being ground. The aim: To improve the crystalline structure of the cutting tools and thus increase tool life.

Do the Reds report any success in using ultrasonic vibrations to improve tool-sharpening setups and cutter life? Russian scientists, A. A. Voronin and A. I. Markov, state: "An efficient way to improve a ground-surface layer is to set up high-frequency (ultrasonic) low-amplitude oscillations during grinding."

Writing in a Soviet technical journal, "Machines and Tooling," these scientists report: ". . . vibrations in surface grinding of heat-resistant alloys and tool steels greatly improve final-finish quality. Vibrations also reduce micro-roughness and residual stresses."

This country isn't letting any grass grow under its feet when it comes to studying the effects of high-frequency oscillations. (Since the charts show Soviet data in metric measurements, we'll list U. S. results the same way.)

U. S. Efforts—Most of the U. S. studies center on the surface grinding of titanium alloys and hard-to-shape steels. Oscillations range from 10-18 kc per sec. Amplitudes up to 0.025 mm (0.009 in.) are employed.

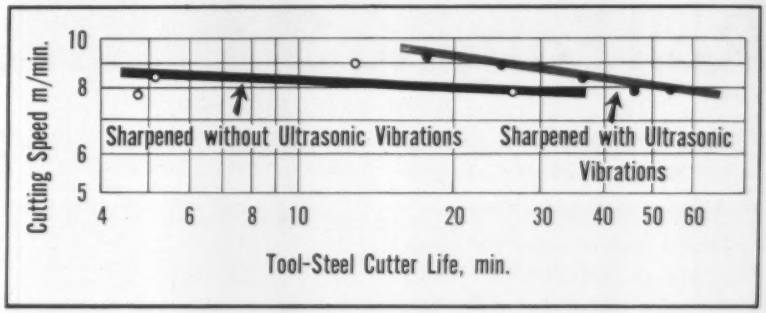
What are the results of these high-frequency low-amplitude tests? The heat generated during the grinding process is curbed to a great extent. And since every cutting edge stays sharp for a longer time period, the required cutting force is reduced by about 50 pct.

Other U. S. results resemble those of the Soviets. With ultrasonic vibrations, a ground finish is about twice as smooth as when the vibrations are omitted. Residual stresses in vibration-ground cutting tools are almost nil.

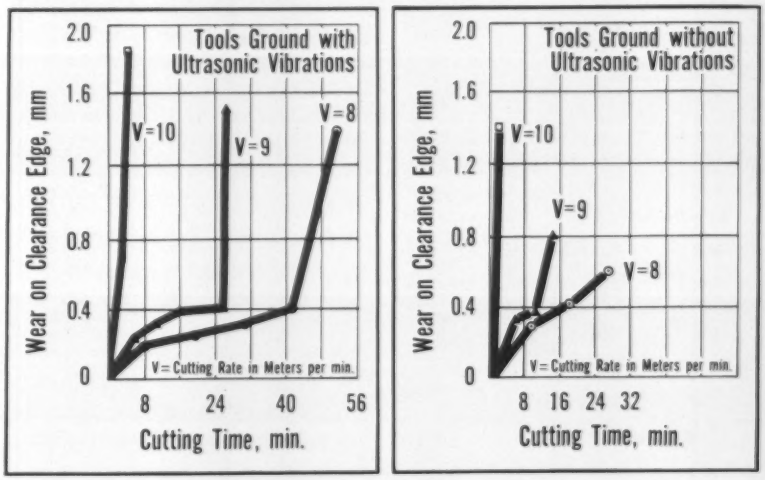
The Russians have also checked out ultrasonics in sharpening carbide cutters. Results prove that ultrasonic oscillation during grinding doubles carbide-cutter life.

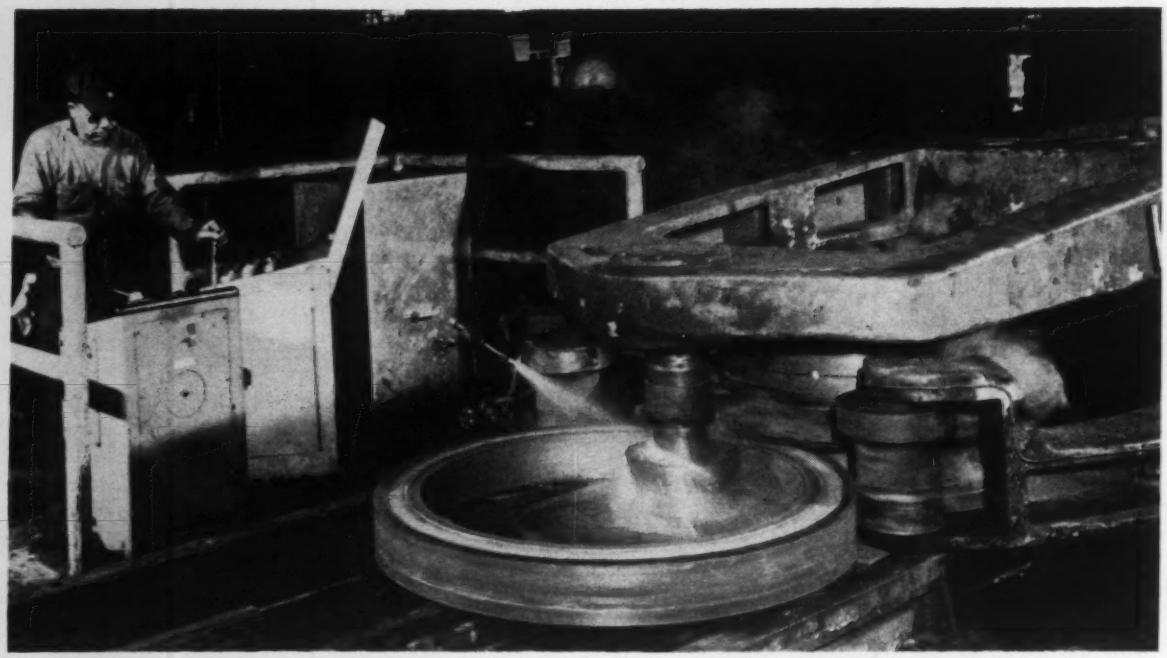
A coolant benefit is also realized. High-frequency low-amplitude vibrations improve the conditions for entry of the cutting fluid into the cutting zone. This eases overheating problems during sharpening.

Ultrasonic Grinding Improves Tool Life



Note Results With Medium Carbon Steel





RING AROUND THE ROLL: Rings up to 80 in. are rolled to a ¼ in. tolerance in about 60 seconds.

Roll Forging Speeds Ring Making

Forged rings are in demand today for components on jets, rockets — even gear blanks.

Take a look at what roll forgings can do. It combines versatility with speed and close tolerance control.

▪ A technological breakthrough in roll forging enables an increase in the production of large steel rings at Kropp Forge Co., Chicago. Rings up to 80 in. in diameter are supplied for rockets, jet engines, locomotives, piping and gear blanks.

The breakthrough was achieved by a newly installed ring-rolling machine built by Wagner Co., Dortmund, West Germany. The unit rolls alloy steel, stainless steel and carbon steel and will soon handle exotic metals.

Quick Look—The machine weighs 50 tons and operates on 200 hp. Only one-third of the unit peers above floor level. The mill operator handles little more than "on" and "off" levers since all dimensional requirements for the rings are preset. When a ring reaches its finished dimensions, the mill disengages automatically, dispensing the ring.

The ring forger has four major parts. First, a powered king-roll which exerts the turning force to roll the ring. Next, two guide rolls follow the ring as it's rolled to keep it in round and eliminate vibration. A rolling mandrel is mounted on the hydraulic forward-moving carriage.

How It Works—To roll a ring, a prepared "donut" is placed over the rolling mandrel. The carriage then moves forward until the king roll contacts the blank's outer surface. The blank begins to rotate because it's being rolled between the outer king roll and the inner rolling mandrel.

As a pressure of 90 tons is exerted, the circumference of the ring grows in length, thus forming a larger diameter. When the ring reaches its predetermined diameter, it contacts a limit switch. This, in turn, releases the rolling pressure.

Rolling continues without pressure for a few more revolutions to true up the ring. The carriage then backs away from the king roll to permit removal of the ring.

Load Limits—The machine can roll a ring's outer diameter as small as 15 in. or as large as 80 in. Maximum ring weight is 2000 lb. The maximum axial length of rings produced is 12¼ in.

Rings up to 80-in. OD can be rolled to a ¼ in. tolerance in about 60 seconds. Smaller rings, produced in about 45 seconds, can be held to 1/16 in. The machine will roll rings with a contoured cross section as well as rectangular cross section.

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Hot Rolled Pickled Steel in Coil	Cold Rolled Sheets	Electrical Sheets
Hot Rolled Sheets	Alloy Sheets and Plates	Electric Weld Line Pipe
Hot Rolled Pickled Sheets		Spiral Welded Pipe

Acme-Newport Steel COMPANY

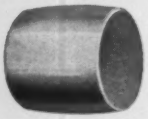
NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

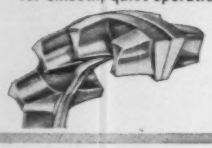
When selecting roller bearing pillow blocks, remember

it's what's inside that counts!

MAXIMUM SIZE AND NUMBER OF ROLLERS for highest capacity



CENTRIFUGALLY CAST, PRECISION MACHINED BRONZE RETAINERS for smooth, quiet operation

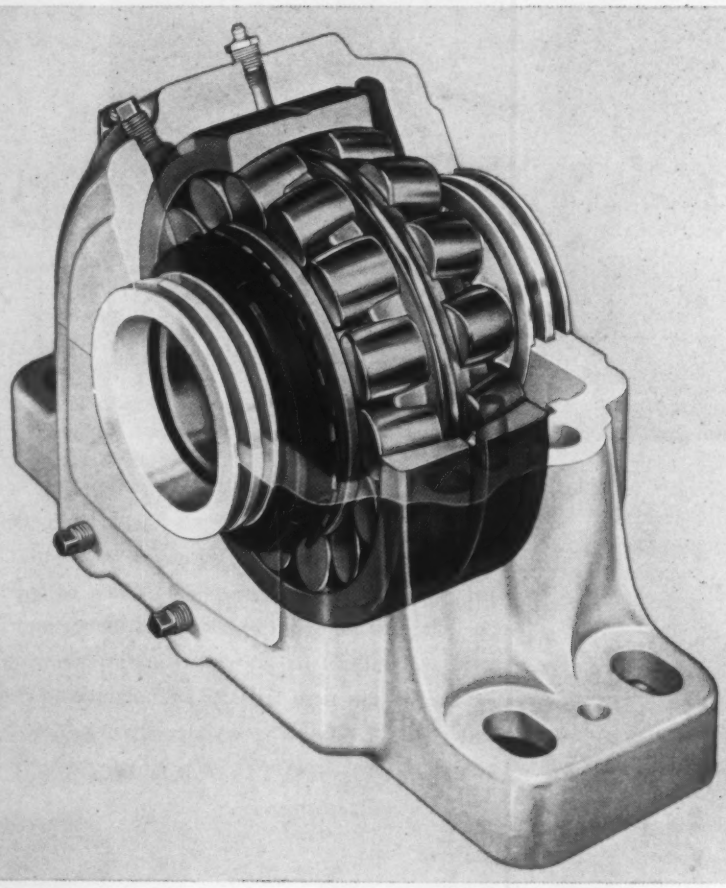


HIGH, HEAVY INNER RING FLANGES for ease of installation and removal

AND INSIDE LINK-BELT ROLLER BEARING BLOCKS you'll find Link-Belt's new spherical roller bearings . . . with big, mirror-smooth, highest capacity rollers; centrifugally cast, precision machined bronze retainers; heavy, broad-shouldered inner rings. *All* the best features of modern bearing design compactly unitized for utmost economy and long service life.

Link-Belt spherical roller bearing pillow blocks are self-aligning. Available in adapter mounting and direct-shaft mounting types for shafts from 1 1/16" to 12". Choice of two effective seals: all-purpose steel, multi-labyrinth seals, or Dacron-contact seals.

For full details, call your nearest Link-Belt office or authorized stock-carrying distributor. Look under BEARINGS in the yellow pages of your telephone directory. Ask for Book 2760.



SERIES 6800, 6900, 7800, 7900 have exceptionally rugged, two piece housings—machined as two perfectly matched parts providing easy installation.

LINK-BELT

SELF-ALIGNING BALL AND ROLLER BEARINGS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney) Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,414

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Longer Chain Life

How to get longer life from your chain drives through proper lubrication is the topic covered in a comprehensive manual. Many ideas for lubricating of high-temperature chains are outlined. Chain cleaning is also discussed. (Oil-Rite Corp.)

For free copy circle No. 1 on postcard

Hard-Facing Hints

How to apply tungsten carbide hard facing is described in a new eight-page illustrated bulletin. The booklet gives detailed procedures for application of hard facing by means of oxy-acetylene torch, and carbon-arc and gas tungsten-arc methods. Performance records for each method and its resulting surface round out the discussion. (Kennametal Inc.)

For free copy circle No. 2 on postcard

Lists Cast Irons

This useful folder contains a rundown on many cast irons. For example: Ductile iron, Ni-Resist, Meehanite, Ni-Hard, Ductile Ni-Resist, gray iron and special alloy irons. Complete list of mechanical properties are included for each type. Specifications are also listed showing applicable ASTM and Military callouts. (Hamilton Foundry, Inc.)

For free copy circle No. 3 on postcard

Copper Welding Wire

Copper and copper-based welding wires for inert-gas welding processes are covered in a new six-page bulletin. The bulletin lists government specifications, AWS, ASTM, ASME, and Boiler and Pressure Vessel Codes for four spooled alloys, deoxidized copper, silicon bronze, aluminum bronze and phosphorus bronze. (All-State Welding Alloys Co., Inc.)

For free copy circle No. 4 on postcard

Chemical Cleaner

A new 12-page booklet discusses the factors involved in the selection of a cleaner and cleaning equipment. It compares the advantages offered by various types of cleaners commonly used in industry. (Non-Rust Div. of Daubert Chemical)

For free copy circle No. 5 on postcard

Automatic Assembly

A new 20-page booklet illustrates completed automation machines, both standard and special models. Also covered are indexing-machine chassis. These latter are stock models ready to apply to special automatic machines requiring intermittent work transfer motion. (Swanson-Erie Corp.)

For free copy circle No. 6 on postcard

Forged-Steel Load Arms

Standard and custom-designed forged-steel load arms are described and illustrated in a new brochure. It provides specifications and descriptions for standard load arms —pin or hook type. (Hyster Co.)

For free copy circle No. 7 on postcard

Precoating Ideas

Four descriptive pages in a new folder offer dramatic suggestions for the use of precoated coils. Stressed in the folder is the company's newest coil coating, Acropon. This formulation is a thermosetting acrylic with good durability. The coating is said to have excellent forming properties, high gloss and color retention. (Desoto Chemical Coatings, Inc.)

For free copy circle No. 8 on postcard

Polyethylene Tanks

Unbreakable, corrosion-resistant molded polyethylene tanks in standard sizes or custom produced to specifications are described in a new two-color bulletin. Both rectangu-

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Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
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71	72	73	74	75	76	77	78	79	80
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FIRST CLASS PERMIT No. 36 NEW YORK, N. Y.

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No postage necessary if mailed in the United States

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Product Manufactured .....

Company .....

Co. Address .....

.....

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FREE LITERATURE

lar and cylindrical shapes with straight sides are shown. (Apex Reinforced Fibre-Glass Div.)

For free copy circle No. 9 on postcard

Special-Driving Center

This new four-page folder shows how a new-type driving center reduces production time and cost. Work can be loaded and unloaded without stopping the machine. Also, the work can be held without preliminary machining of the end face. (Power Grip, Inc.)

For free copy circle No. 10 on postcard

Tire Maintenance

This comprehensive 32-page booklet tells you how to get more mileage and safety from your tires. The book has already been termed invaluable by many fleet owners and driving schools. (Pirelli Sales, Inc.)

For free copy circle No. 11 on postcard

Power Transmissions

In 28 pages a new brochure outlines design and performance characteristics of a line of power-shifted transmissions. The brochure includes a complete mechanical description of the full line of transmissions. (Hyster Co.)

For free copy circle No. 12 on postcard

Ball Joints and Pivots

A new 4-page catalog introduces a new concept in hollow-stud ball joints and pivots for linkages. Included are illustrations of many types and sizes along with engineering application data for each. (Link-Age Corp.)

For free copy circle No. 13 on postcard

Speed Reducer

A small shaft-mounted speed reducer, latest addition to the Torque Arm line, is described in a four-page bulletin. Reported to be the smallest available reducer of its type, the unit is specifically designed for shafts of 1½ in., or less, and for power requirements from 1-90 hp. (Dodge Mfg. Co.)

For free copy circle No. 14 on postcard

High-Alloy Casting

High-alloy casting in the static, centrifugal and shell-molded categories plus a complete list of ACI nomenclature, metallurgical properties and applications for some 55 alloys are presented in a new 20-page catalog. Special emphasis is given to a recently-developed alloy for casting. It's to be used in the 2100°-2200°F range, with limited applications to 2300°F. (The Duraloy Co.)

For free copy circle No. 15 on postcard

Finishing Equipment

New catalog sheets list a complete line of plating, polishing and spray-painting equipment and supplies. All items are alphabetically listed in the new literature which represents a handy guide for purchasing. (J. Holland & Sons, Inc.)

For free copy circle No. 16 on postcard

Chucking Machine

A handy folder describes a line of multiple-spindle chucking machines and offers a comprehensive listing of parts best suited to production on each machine. A compilation of the industries now using chuckers plus a description of how short-run parts can be produced on the machines is also included. (The Baird Machine Co.)

For free copy circle No. 17 on postcard

Structurals Guide

Significant developments in constructional steels and new design concepts are offered in a new 28-page booklet. This compilation of technical data and new ideas is arranged as a convenient and compact guide for the people who design, fabricate and build with structural steels. Key facts cover structural carbon steels, high-strength and high-strength low-alloy steels and heat-treated constructional-alloy steels. (U.S. Steel Corp.)

For free copy circle No. 18 on postcard

Refractories Handbook

A newly-revised handbook covers various methods of installing periclase ramming mixes for installation in open-hearth furnaces. Included also is information on suggested heat-up schedules. (Kaiser Refractories Div., Kaiser Aluminum & Chemical Corp.)

For free copy circle No. 19 on postcard

Story of Molybdenum

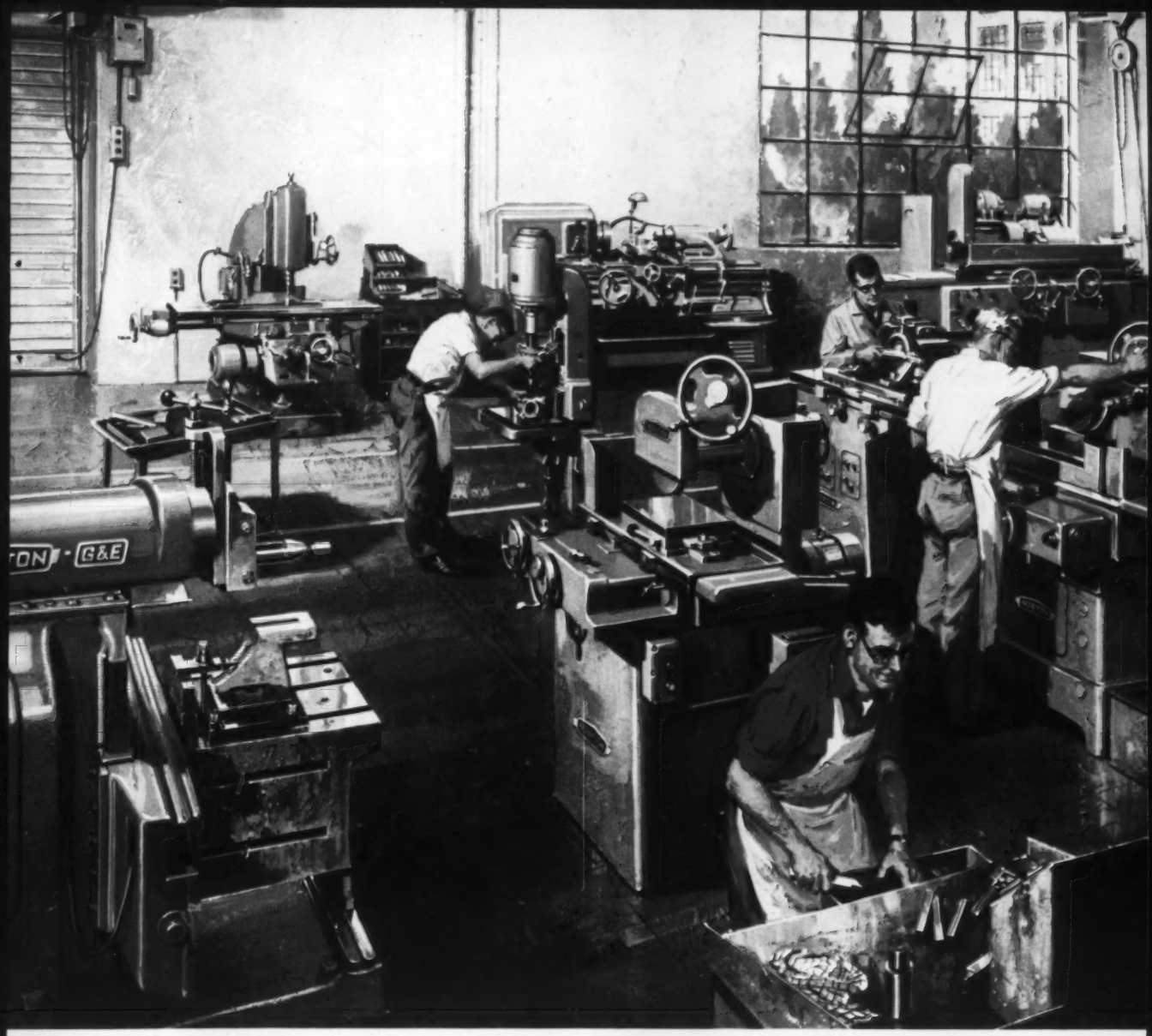
The properties of molybdenum are described in a new 58-page booklet. It also lists the many mill forms and shapes which are available. A good deal of the data covers present uses of the metal in industry. Another section of the text tells how to machine and work the metal to finished form. (Schwarzkoph Development Corp.)

For free copy circle No. 20 on postcard

Stamping Source

New and up-to-date, this four-page brochure describes a stamping company's wide range of services. (Worcester Pressed Steel Co.)

For free copy circle No. 21 on postcard



Brightening a tool room with the "Touch of Gold"

Don't let low grade equipment make your tool room a dark spot in your plant operation.

Brighten up with the modernizing, economizing "Touch of Gold" — built into all Norton grinders!

Here you see the five basic types of Norton tool room machines: universal grinders, hand or hydraulic surface grinders, cutter and tool grinders . . . and G & E shapers.

For faster, easier, lower cost grinding, all here include Norton-developed advancements — such as the cutter and tool grinder's tilting wheel head and the hydraulic surface grinder's work table speed of 150 feet per minute.

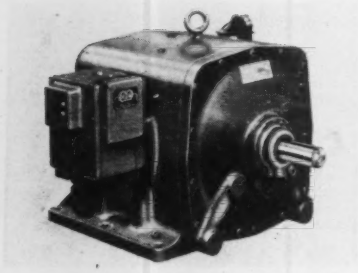
Your Norton Man will be glad to show you how "Touch of Gold" benefits can be added to your own tool room or production grinding. Or write to NORTON COMPANY, Machine Tool Division, Worcester 6, Mass.

NORTON
MACHINE TOOLS

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

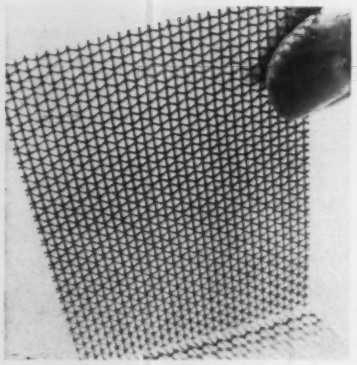
New Materials and Components



Controlled Pumps Vary Displacement on Demand

A new and complete line of two-way, variable-displacement pumps features electrohydraulic, servo-operated controls. Any number of variable, low-level (5-w or less) input signals from remote positions can accurately and proportionately vary the rate of pump flow from either directional port. To do this, a single-stage, servo-control valve directs low-pressure fluid to or from the stroker, varying pump displacement. On small units, zero to maximum displacement takes just 0.15 second. (The Oilgear Co.)

For more data circle No. 25 on postcard, p. 149

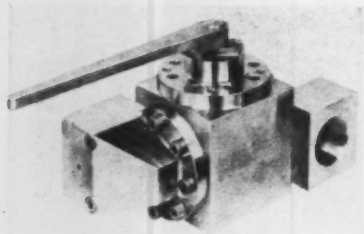


Stainless-Alloy Wire Cloth Resists 1000°F Heats

Wire cloth, woven of a high-temperature stainless-steel alloy, has just been announced by Reynolds Div., National-Standard Co. Woven NS-A286 boasts properties comparable to those of most-highly alloyed materials in the 600°-1000°F range. It can be used in jet-engine, gas-turbines and other high-temperature applications. And wire-cloth parts can be hardened after forming. In fact, tensile strength increases up to 73 pct after heat treating. Typical properties of 0.080-in. NS-A286 wire are listed in psi below.

Reduction As Drawn		16hr, 1350°F
None	103,500	176,000
15 pct	122,500	190,000
30 pct	150,000	198,000

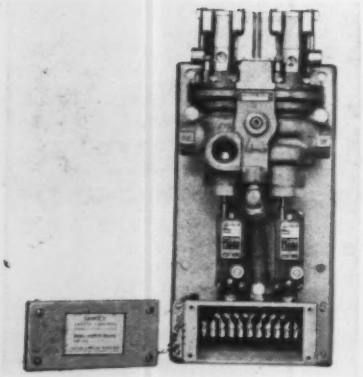
For more data circle No. 26 on postcard, p. 149



High-Pressure Shutoff Unit Handles 6000 PSIG

For delivering fluids under high pressures up to 6000 psig, a recently-developed ball-shutoff valve combines stainless-steel construction with Teflon gaskets and seals. Specifically engineered as missile ground-support equipment for a propellant loading and pressurization system, it handles nitrogen gas at temperatures ranging from —65°F to 350°F. The valve also deals with nitrogen tetroxide. (Koehler Aircraft Products Co.)

For more data circle No. 27 on postcard, p. 149



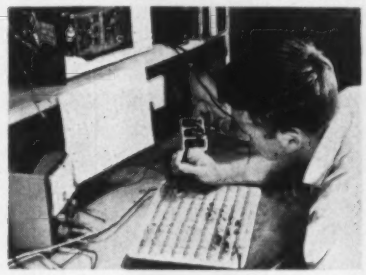
Dual Valves Safeguard Cyclic Control Systems

How do you insure that a power press or other cyclic machine does not repeat due to valve failure? A foolproof approach to the problem is offered by a new dual-valve safety system. Both valves are interlocked to prevent repeat operation in the event of electrical or mechanical failure to either valve. This concept represents a new standard of protection for both operators and equipment. When wired into a system, electrical monitors check each valve during each cycle. In the event of a malfunction, an automatic stop is made. Thus, neither valve can become defective without the operator's knowledge. Compact and lightweight, the dual-valve system features unitized construction for long service life. All components mount on a ¼-in. steel plate. (Fawick Airflex Div., Fawick Corp.)

For more data circle No. 28 on postcard, p. 149

Circuit Builder

Quick assembly, rearrangement and disassembly of experimental circuits, without the use of solder, spring clips or jumper wires, is possible with a new item called the Circuit Builder. For use by design engineers and college electronic labs, the Circuit Builder is com-

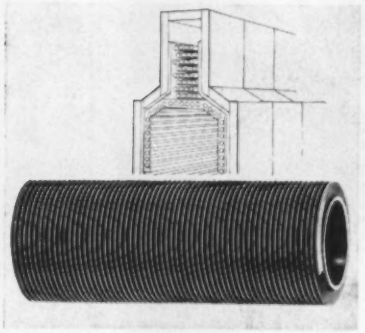


posed of 108 gold-plated cells spaced 1 in. apart in nine horizontal rows of twelve. The two dimensional layout, of the 9½ x 12½ in. cellulose-filled phenolic board, and letter vs. number coding of cells, facilitates work with schematics and transfer to printed circuit cards. (Circuit Structures Lab)

For more data circle No. 29 on postcard, p. 149

Furnace Fin-Tubes

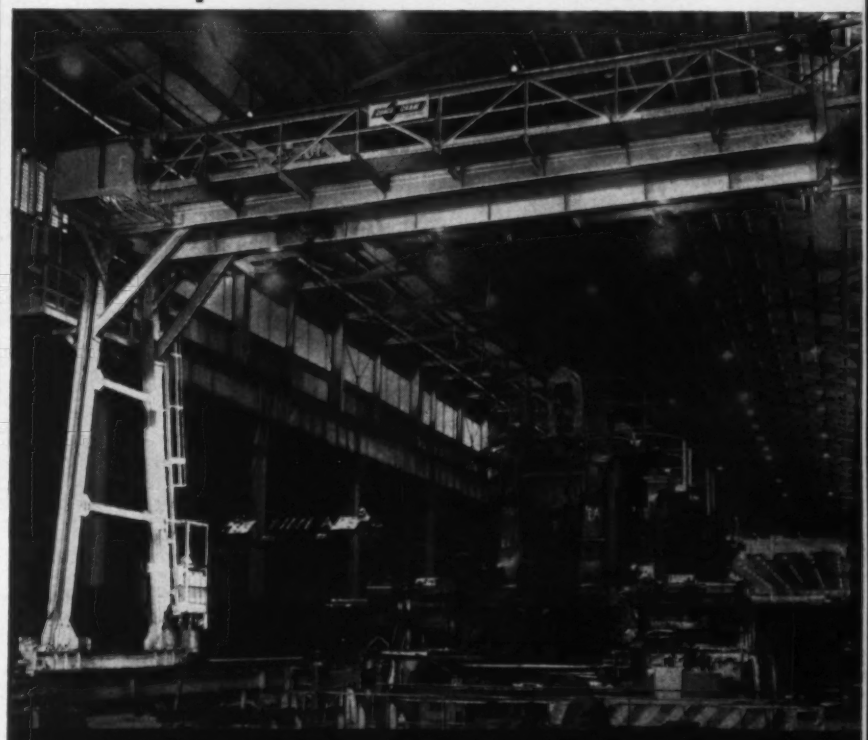
Large diameter K-Fin tubing is designed for use in the convection sections of furnaces heating petrochemicals or hydrocarbons for proc-



essing; waste heat boilers; for tank heating and other fired and unfired applications. These tubes provide 10 times or more outside surface area per foot of length than plain bare pipe or tubing, increasing the capacity of the furnace, the efficiency of the furnace, or both. The helical fins are wrapped tightly into grooves plowed on the outside of the tube or pipe. The metal dis-

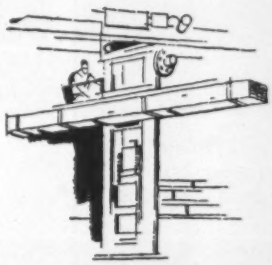
CONCO OVERHEAD TRAVELING CRANES

in capacities to 150 tons



Conco Semi-Gantry Crane custom-engineered for service in a Chicago area steel mill

CRANES HOISTS CONCO



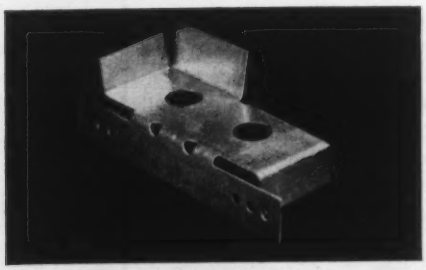
Write for Crane Specifications Tablet containing five sets of general service crane specification data and forms.

For information on Conco Cranes, Hoists and Trolleys Request Bulletin 30008

Material Handling Division
CONCO ENGINEERING WORKS, INC.
Mendota, Illinois

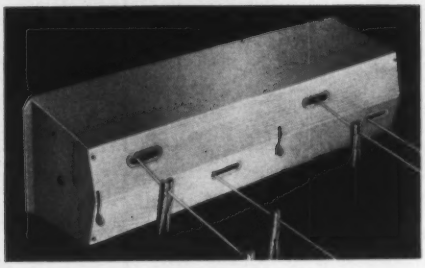
AFFILIATES:
SPARTAN TOOL DIVISION, Powered Sewer Cleaning Equipment
FIELD CONTROL DIVISION, Barometric Draft Controls
CONCO BUILDING PRODUCTS, INC., Brick, Tile, Stone.

CHICAGO TRAMRAIL, manufacturer of "Trak-Rak" Stacker Cranes, Monorail Systems, and "Fas-Lok" Storage Racks at 1330 S. Kostner Ave., Chicago, is now a DIVISION OF CONCO ENGINEERING WORKS, INC.

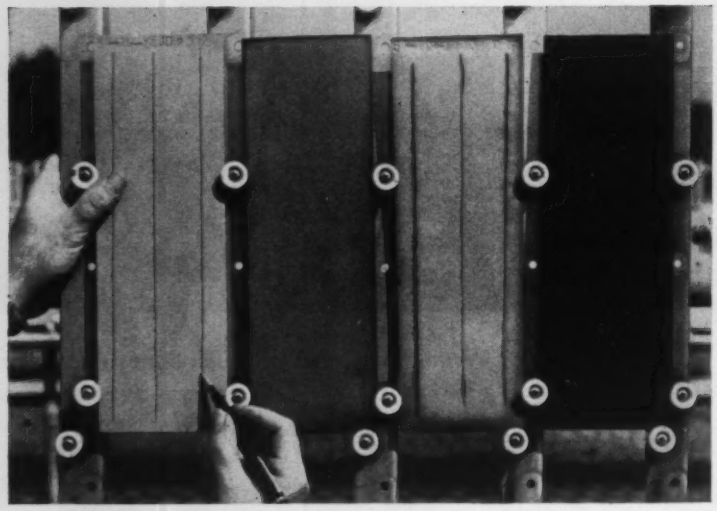


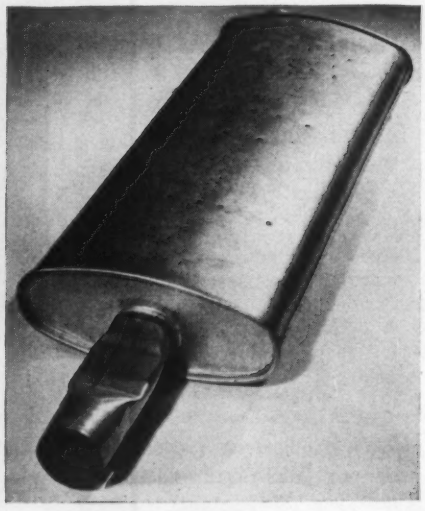
Armco ZINCGRIP Steel

Armco ALUMINIZED STEEL Type 2



5 Armco Coated Steels Can Help





Armco ALUMINIZED STEEL Type 1

Steel

This label identifies modern, dependable steels in your products

After 3-years' exposure outdoors, paint holds tightly to ZINCGRIP A, PAINTGRIP (far left). No rust even where scratched. No rust on the unpainted sample, either (second from left). Samples on the right are phosphate-treated cold-rolled steel, one painted, the other unpainted. Paint has suffered. Rust is evident on the unpainted sample.

1. NEW ARMCO ZINCGRIP® A, PAINTGRIP®. This *new* kind of hot-dip zinc-coated steel is specially prepared to take a paint finish that's every bit as attractive as a paint finish on cold-rolled steel! It's *spangle-free*, holds paint *tighter and longer*, permits *twice as many spot welds* as ordinary galvanized before electrode tips need redressing. It's available *now* in commercial quantities.

2. ARMCO ZINCGRIP STEEL has a tightly adherent zinc coating that gives products durable protection at an *average cost of about 2⅓ cents per square foot.* Savings: About .92 cents per square foot over typical cost of painting. The door part pictured, for example, was previously fabricated from cold-rolled steel, then painted for protection. It is now made of Armco ZINCGRIP at a significant saving.

3. ARMCO ALUMINIZED STEEL Type 1 means greatly increased service life—for mufflers and other consumer, commercial and industrial products menaced by heat and corrosion. Furnace, heater and appliance parts made from this special hot-dip aluminum-coated steel won't discolor to 900 F, won't scale under 1250 F. Reflective parts bounce back up to 80% of radiant heat, remain strong.

New steels are born at Armco

You Fight Costs and Competition

They combat corrosion, solve heat and painting problems.

4. ARMCO ALUMINIZED STEEL Type 2 offers exceptional resistance to outdoor corrosion. In a mild industrial atmosphere, for example, its hot-dip aluminum coating outlasts the coating on unpainted commercial galvanized steel sheets 4-to-1. It reflects heat, too. The manufacturer of the "vanishing clothesline" casing in the photo cites *savings of 30%* in switching from aluminum to Armco ALUMINIZED STEEL Type 2. The reason: ALUMINIZED STEEL permitted reduction in metal thickness without loss of strength. It also assured greater resistance to damage. Ideal for construction products exposed to the weather.

5. ARMCO COLD-ROLLED PAINTGRIP and low painting costs go hand-in-hand. Over a mill-applied electrolytic zinc "flash" goes a paint-holding film. You simply fabricate and paint immediately. Sheets resist rusting in storage, take severe fabrication.

Armco Division
Armco Steel Corporation, Dept. C
1901 Curtis Street, Middletown, Ohio

SEND DATA ON

- ☐ New Armco ZINCGRIP A, PAINTGRIP
- ☐ Armco ALUMINIZED STEEL Type 1
- ☐ Armco Cold-Rolled PAINTGRIP
- ☐ Paint Savings with Armco ZINCGRIP
- ☐ Armco ALUMINIZED STEEL Type 2

Name _____

Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

ARMCO Armco Division

SUNBEAM electric heater cases get uniform finish with RANSBURG electrostatic. . . . 6 times as many per gallon of paint—15 times faster.

"Paint Mileage Leaps 500%.... Production Upped 15 Times" Reports ENAMELED STEEL & SIGN CO.

Curt Simmons, President, ENAMELED STEEL & SIGN COMPANY of Chicago, describes results with RANSBURG Automatic No. 2 Process Electro-Spray: "We first painted cases for the new SUNBEAM portable electric heaters with air hand spray at the rate of 200 pieces per day using 6 gallons of paint. Now, with RANSBURG electrostatic we've increased production 1400% to 3000 pieces daily with only 15 gallons of paint." An increase of 500% in paint mileage! *What would savings like this mean in your finishing department?*

QUALITY IMPROVED WITH RANSBURG ELECTRO-SPRAY

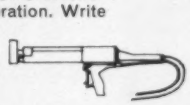
Sags and runs, a problem with the air hand spray, have been eliminated with the automatic electrostatic equipment. Mr. Simmons adds: "Now we achieve a uniformity over the configurated area which wasn't always possible before. We know the 50,000th piece will turn out the same as the first."

ENAMELED STEEL—sold on the efficiency and versatility of RANSBURG Electro-Spray—uses 14 automatic No. 2 Process units to meet the heavy demands of their diversified, high volume production.

NO REASON WHY YOU CAN'T DO IT TOO

Manufacturers—large and small—are reporting similar savings in paint and labor with increased production. If your volume doesn't justify automatic electrostatic equipment, perhaps the RANSBURG electrostatic hand gun will help cut costs in your finishing operation. Write for our new brochure showing actual in-plant production photos, savings figures and detailed information on RANSBURG No. 2 Process Electro-Spray.

RANSBURG



RANSBURG Electro-Coating Corp.

Box 23122, Indianapolis 23, Indiana

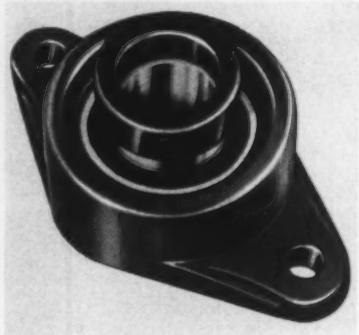
Affiliates in AUSTRALIA • AUSTRIA • BELGIUM • BRAZIL • DENMARK • ENGLAND • FRANCE • FINLAND GERMANY • HOLLAND • INDIA • IRELAND • ITALY • NEW ZEALAND • NORWAY • PAKISTAN • SOUTH AFRICA SPAIN • SWEDEN and SWITZERLAND

placed by the grooves is then forced tightly against the sides of the fins to form a tight metal-to-metal bond. It comes with carbon steel, stainless or alloy fins, on carbon steel, stainless or alloy pipe or tubing with 1 to 6 in. diam, with from 2 to 8 fins to an inch. (The Griscom-Russell Co.)

For more data circle No. 30 on postcard, p. 149

Flange Bearings

Latest addition to a new line of "Life-Lube" ball bearings is a flange-type housing with two drilled holes. These are accurately spaced to allow interchangeability with most other makes of bearing units. The housing has a spherical bore to permit the bearing to self-align. The new bearing unit is available for shaft diameters of 1/2, 5/8, 11/16,



3/4, 7/8, 15/16, 1, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, and 1 7/16 in. The bearing is locked to the shaft by a self-locking eccentric collar. This mates with an eccentric cam on the wide inner ring to provide a precision fit on the shaft. Periodic lubrication is not required since bearing is sealed for life. The rubber-shielded seal prevents the entry of foreign particles that might act abrasively. Factory application of an approved, high-quality ball-bearing lubricant does away with the dangers of overgreasing, undergreasing or improper lubricant. T. B. Wood's Sons Co.)

For more data circle No. 31 on postcard, p. 149

Nylon Air Hose

Nycoil, the nylon air hose that stretches and recoils like a tele-

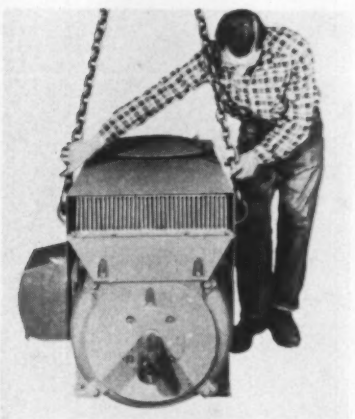
phone cord, is now supplied with a compression elbow fitting and a non-slip aluminum ferrule. This type of assembly locks on the smooth sur-

face of the hose and permits unobstructed air flow. If overtightened or subjected to severe pulling the fitting remains and will not pull off. The air hose can be connected to any straight or pistol-type air tool or to equipment requiring air pressure up to 200 psi. (Nycoil Co.)

For more data circle No. 32 on postcard, p. 149

Heat-Exchanger Motors

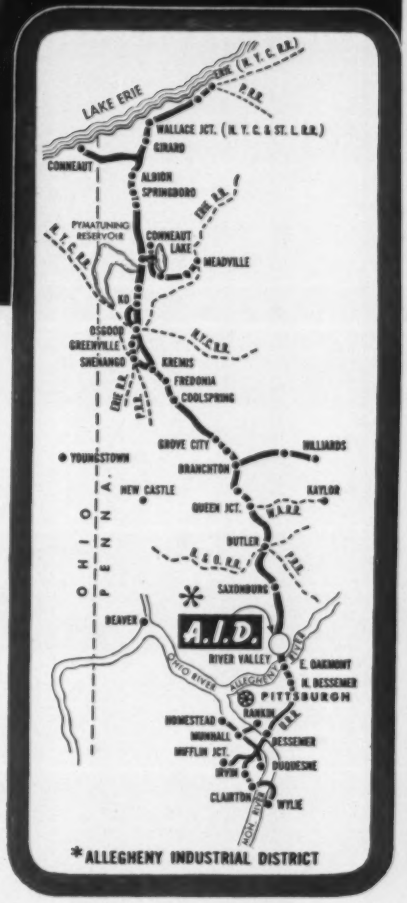
Totally-enclosed, a new line of dc motors features an aluminum air-to-air heat exchanger in ratings 75 to 250 hp at 1150 rpm. Generators in corresponding ratings are available also. An ac totally-enclosed vertical motor, to drive the blowers, is recessed in the dc motor commutator bracket to reduce the over-all height of the complete unit. The compact heat exchanger is



Now is the *right time* to build your new plant or warehouse, and the *right place* is the 100 acres of prime land at the Allegheny Industrial District. Just 14 miles from downtown Pittsburgh, you get fast Bessemer freight and piggy-back service to the nation's principal markets via seven major trunk lines. There's quick access to major highways, too.

Other strategic advantages of an Allegheny Industrial District site are: 24-hour delivery of steel and other basic materials; an ample labor force with skills widely diversified; all utilities to meet any production or warehousing need; located at the center of America's No. 1 market area.

Investigate today! Write or phone for location factors. Complete confidence is assured.



BESSEMER and LAKE ERIE RAILROAD CO.

INDUSTRIAL DEVELOPMENT DEPARTMENT

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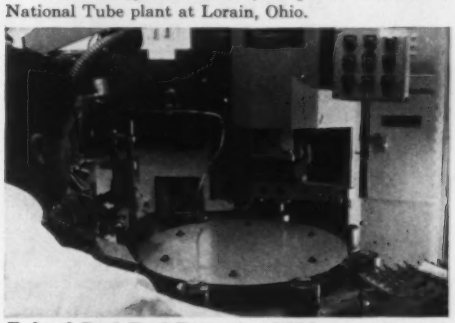
The Bessemer Man is at your "Site Service"

Warco
PRESS

◀ ***Warco Press Line*** composed of three 400-ton straight side, eccentric gear presses forms automobile wheel "spiders" at The Budd Company's Detroit plant. Here, William F. Longfield, manager of press engineering and sales for McKay's Federal-Warco Division, looks over a finished wheel with Edwin Seiberlich, works manager, and R. O. Greenshields, plant manager.

Photo by ARNOLD NEWMAN

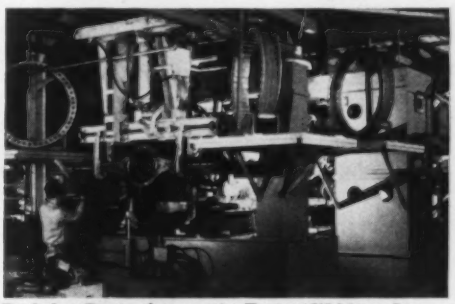
McKay Tube Mill Feed Line sends steel to the tube mill continuously at a rate of 1,800 fpm at U. S. Steel's National Tube plant at Lorain, Ohio.



Federal Dial Feed Projection Welder, one of several used by the Bendix Corporation to weld transistor assemblies. It will weld 2,000 assemblies per hour with exacting precision.

Uncoiling, flexing, processing, slitting, shearing, feeding, forming, stamping, and welding . . . keeping ***metal in motion*** in the most economical manner possible, from coil to finished product, ***is the business of McKay Machine.***

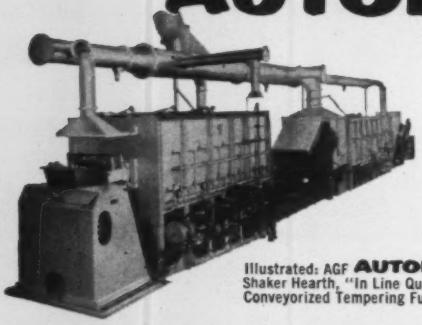
McKay Machine, its divisions and subsidiaries produce the widest range of metal preparation, processing, forming and welding equipment available anywhere. Because of this they can design and build complete, integrated production lines of perfectly mated machinery. This makes it possible to achieve compactness and bring about efficiencies not otherwise practical. It also means the manufacturer is concerned with only a single source of responsibility and supply. That's why more and more cost-conscious metalworking firms are making it a point to know *The McKay Machine Company, Youngstown 1, Ohio.*



Berkeley-Davis Automatic Fusion Welding Lines, such as this one of two recently installed at American Metal Products Company in Detroit for the automatic production of over 200 sizes of motor vehicle axle housings, lead the industry in precision operation, production efficiency, and flexibility.

AGF
AUTOMOTION

See us at the Metal Show—
Exhibit 821



Illustrated: AGF **AUTOMOTION** Shaker Hearth, "In Line Quench", and Conveyorized Tempering Furnace.

AUTOMOTION best describes AGF's unique automatic heat treating furnaces . . . both Reciprocating Hearth and Rotary Retort . . . employing the "Work in Motion" principal that assures uniformity of case and hardening.

AGF's **AUTOMOTION** Furnaces operate **wholly automatically** and **continuously,** and are easily placed in any continuous or intermittent production line.

Send for catalogs and details of models to meet your specific needs

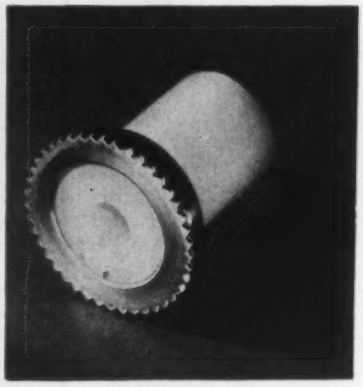
AMERICAN GAS FURNACE CO. 1004 LAFAYETTE STREET, ELIZABETH, N. J.

made up of welded fin-type aluminum ducts. An internal blower pulls hot air from inside the motor through the ducts, while an external blower pulls air over the ducts and discharges heated air through the dripproof front end of the heat exchanger, providing maximum efficiency. (Westinghouse Electric Corp.)

For more data circle No. 33 on postcard, p. 149

Insulated Stand-Off

A new insulated self-clinching stand-off boasts features to simplify assembly problems and effect savings in time and labor. Made of Delrin, the stand-off has high dielectric and tensile strength. It also



withstands creep or cold flow. The stand-off is available in ½-2 in. lengths and thread sizes 6-32. (Spyraflo, Inc.)

For more data circle No. 34 on postcard, p. 149

Pin-in-Pin Fastening

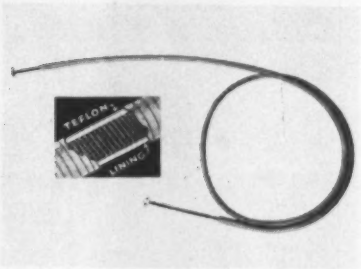
One good fastener deserves another, when a new design suddenly needs beefing up or existing equipment requires more strength. Now, if the second fastener simply fits inside the first, you get more performance without sacrificing space. Extra drilling, tapping or other cost-boosting operations are also sidetracked. What kind of fastener can do this? Surprisingly enough, simple spring pins fill the bill. These split-tube units are designed to be driven into a hole slightly smaller than the spring-pin OD. Compression locks each pin firmly in place. This same priniciple carries over to pin-in-pin

combinations, since one spring pin is simply inserted within a larger spring pin. (Standard Pressed Steel Co.)

For more data circle No. 35 on postcard, p. 149

Teflon Cable Linings

An inner lining of Teflon assures frictionless movement of push-pull control cables and flexible drive

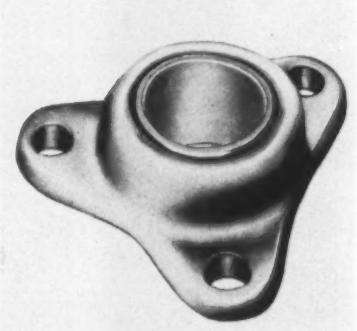


mechanisms. New facilities are available to extrude linings to most inner and outer diameter tolerances to insure a tight fit and yet provide frictionless movement for rotating shafts or push-pull control cables. Teflon does not absorb moisture, and has excellent dielectric properties. (Timely Technical Products, Inc.)

For more data circle No. 36 on postcard, p. 149

Self-Aligning Bearing

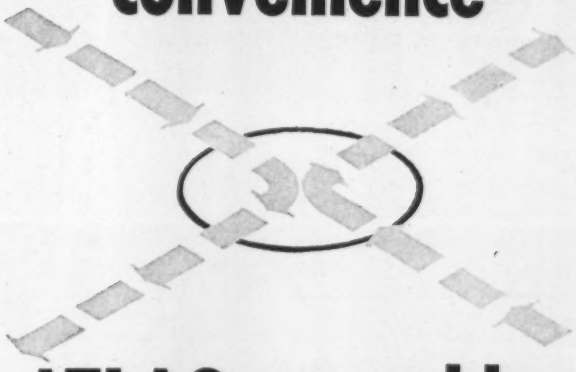
A new three-bolt, flange-mounting bearing is the latest addition to the "LUBE ALIGN" line of bearings. The newcomer consists of a one-piece, self-lubricating bronze bearing nested in an aluminum



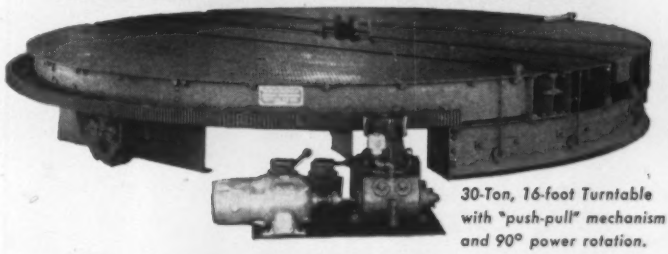
housing. The bearing is also self-aligning. It provides total contact support which permits the use of small-size units for heavy loads. (Bronze Bearings, Inc.)

For more data circle No. 37 on postcard, p. 149

for turnaround convenience

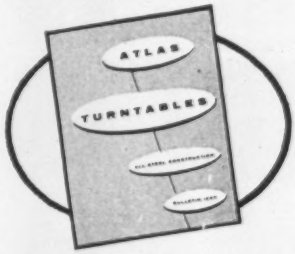


ATLAS turntables



30-Ton, 16-foot Turntable with "push-pull" mechanism and 90° power rotation.

Atlas turntables are made to customer specifications in any size and capacity; for manual or power rotation. Either flush or raised rail arrangement can be provided, with rail size and gauge to match existing track.

Request 

Bulletin 1297

Since 1896... Engineers-Builders of Ore Transfers... Scale Cars... Coke Quenchers... Coal Larries... Door Machines ... Safety-Type Transfers... Storage Battery Locomotives

ATLAS CAR & MFG. COMPANY

1140 IVANHOE ROAD

CLEVELAND 10, OHIO

This is an unretouched photograph of automotive and appliance trim formed of Sharon's bright annealed Stainless Steel. While it loses some of its sparkle in the advertising platemaking process, it gives you some idea of the brilliance of this new Stainless Steel. A detailed pamphlet has been prepared. Write for your copy today.

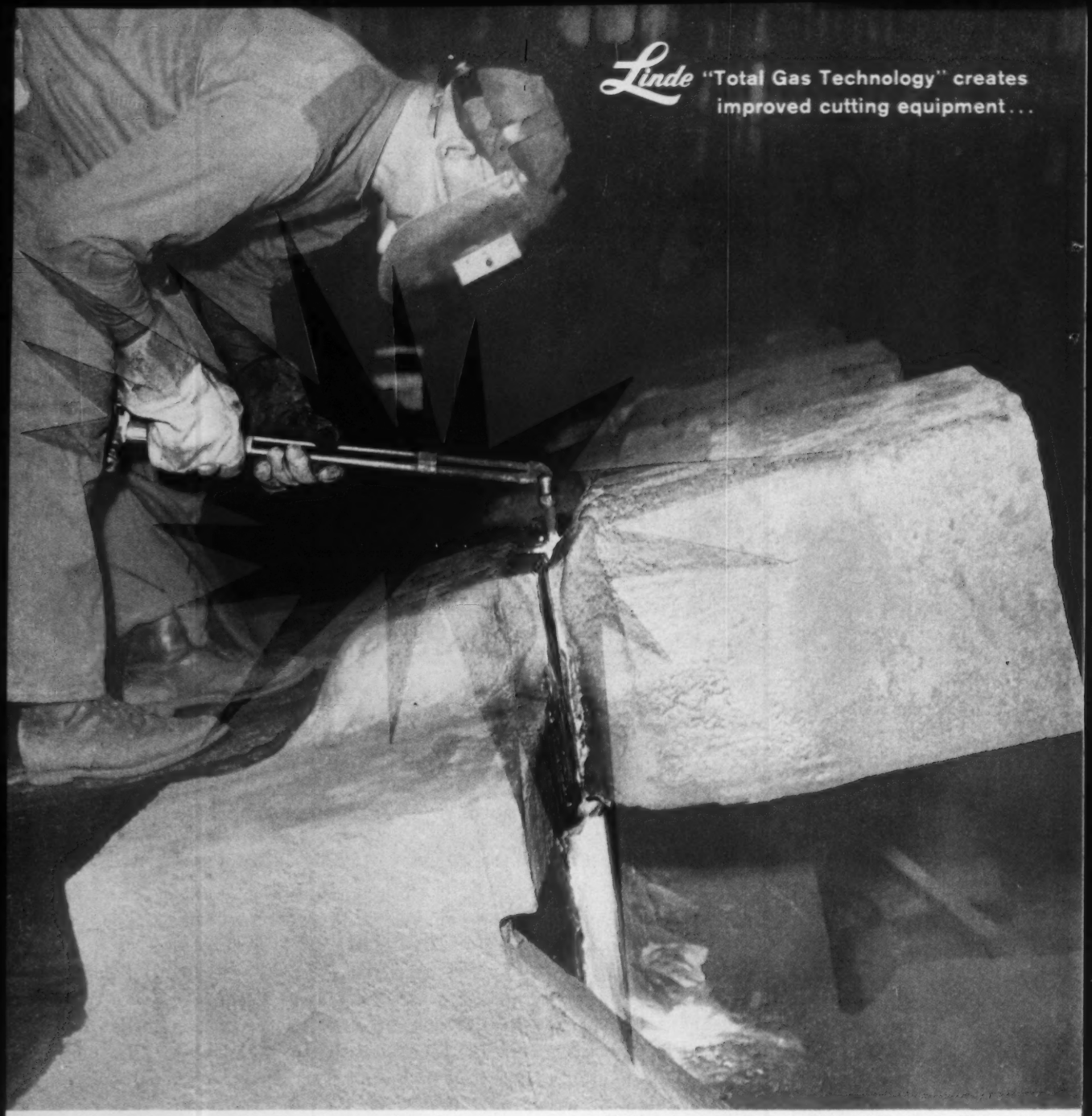
WHY DESIGNERS LIKE

The brightest, most sparkling Stainless Steels ever developed are creating unusual excitement among manufacturers of our high-quality products. Automotive engineers, appliance designers, furniture people, architects and business machine makers, to name a few, are specifying Sharon *bright annealed* Stainless Steels to a greater degree than ever before. *Bright annealed* Stainless Steel is truly the best looking metal ever made. What's more, it has excellent forming characteristics and improved corrosion resistance, and it reduces or often eliminates buffing operations on high-finish parts. To accent and enhance the appearance of your products, think of the new *bright annealed* Stainless Steels, and when you do . . . think first of the *Sharon Steel Corporation, Sharon, Pennsylvania.*

SHARON *Quality* STEEL

AMERICA'S FOREMOST PRODUCER OF LIGHT STEELS

SHARONSTEEL®



Using natural gas, OXWELD C-66 quickly slices off large riser.

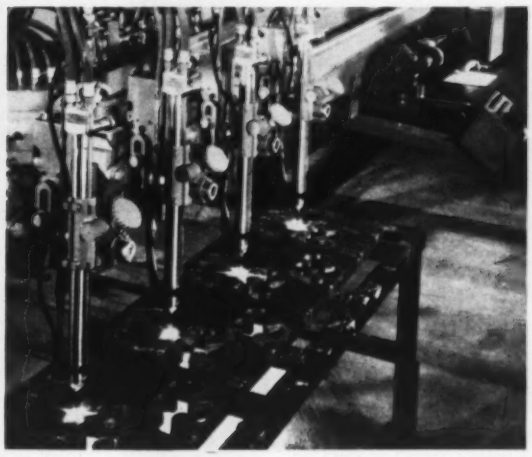
CUTS COSTS BECAUSE NO CORNERS

In actual competitive tests, the new OXWELD C-66 Natural Gas Torch has saved 15% or more on operating costs compared with other cutting torches. Why? Because no short-cuts were taken in design and manufacturing. ✦ Designed for use with natural gas, propane, butane, or city gas, the C-66 can slice through 30 in. of metal *in one pass!* ✦ Because of its tremendous preheat capacity and gas flows (up to 300 cfh of natural gas and 3000 cfh of oxygen), the OXWELD C-66 starts faster and cuts quicker than any other torch on the market. ✦ You can use the C-66 for all your flame cutting . . . from thin sheet metal to the largest risers. For additional information, call or write your nearest LINDE representative.

"LINDE," "OXWELD," AND "UNION CARBIDE" ARE REGISTERED TRADEMARKS OF UNION CARBIDE CORPORATION AND USED BY ITS DIVISION, LINDE COMPANY, 270 PARK AVENUE, NEW YORK 17, N. Y.

OXWELD nozzles are chrome plated to shed slag and spatter. You pay a little more but they cost you a lot less in the long run. Service life is boosted at least 150%. Mirror-like smoothness of gas passages assures stable flows and clean cuts. There is an OXWELD nozzle for every type of work . . . more than 40 different nozzles for the C-66 torch alone.

Ideal for precision machine cutting, using natural gas or propane, the new OXWELD C-67 torch incorporates all the features of the C-66. The new C-67 will cut any thickness up to 18 inches. You get faster starts and sharper, cleaner cuts that require little or no finishing. New two-piece OXWELD nozzles are available for the C-67 torch.



WERE CUT

LINDE COMPANY

UNION CARBIDE

Process Reduces Iron Ore

Ore reduction, T. H. Whaley (assigned to Texaco Development Corp.,) Aug. 22, 1961. In the hydrogen reduction of beneficiated hematite or other iron-oxide ores, the oxide is first partially reduced in an initial zone using hot carbon monoxide and hydrogen. U. S. 2,997,383.

Procedure Improves Steel

Metallurgical process and the steels it manufactures, E. S. Nachtman (assigned to La Salle Steel Co.,) Aug. 29, 1961. In a method for improving the mechanical and physical properties of non-austenitic steel bars and rods having a pearlitic structure in a matrix of free ferrite, the steel is normalized. Then the bars or rods are reduced in cross-sectional area in a draw die. Temperature must stay between 250°F and the lower critical temperature of the steel. U. S. 2,998,336.

Check Sulphur Content

Method of quickly determining the approximate phosphorus content of a steel specimen, W. A. Burquist and H. J. Hansen, Jr., (assigned to U. S. Steel Corp.,) Aug. 22, 1961. In a method for quickly determining the approximate phosphorus content of annealed steel strip, a sample of the steel is immersed in hydrochloric acid, and the resulting gas allowed to escape for a few minutes. Then the gas flow is restricted and pressure readings are taken. U. S. 2,997,372.

Pellets Get Furnace Firing

Process of reducing molded bodies comprising metallic oxides, T. Basen (assigned to Elektrokemisk A/S, Oslo, Norway), Sept. 12, 1961. In the production of an iron or iron-manganese ore sinter for use in electric furnaces, ore-fuel pellets are fired in a shaft furnace. Carbon monoxide is generated and burned in the central section of the shaft to indurate the material nearer the center. This leaves the outer portion of the charge unfused and free flowing. U. S. 2,999,748.

Age-Hardenable Stainless

Martensitic steel, R. A. Lula and T. H. McCunn (assigned to Allegheny Ludlum Steel Corp.,) Sept. 5, 1961. An age-hardenable, martensitic-type stainless steel consists of up to 0.04 pct C, up to 2 pct Si, 0.25-3 pct Mn, 7-12 pct Cr, 1-6 pct Ni, 0.5-1.75 pct Al, up to 5 pct Mo, Cb, W, V, and/or Ti, up to 0.05 pct N, and the remainder substantially all Fe. U. S. 2,999,039.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

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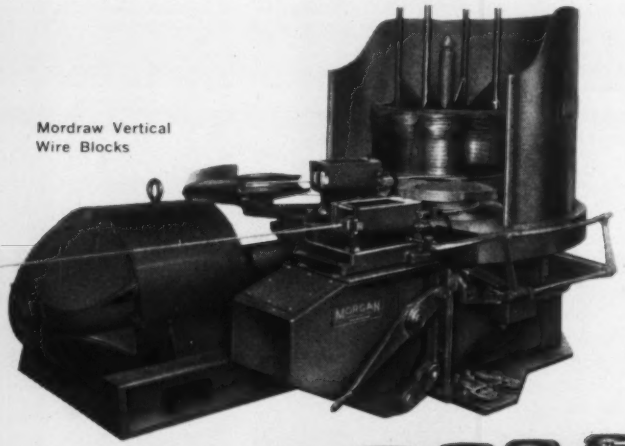
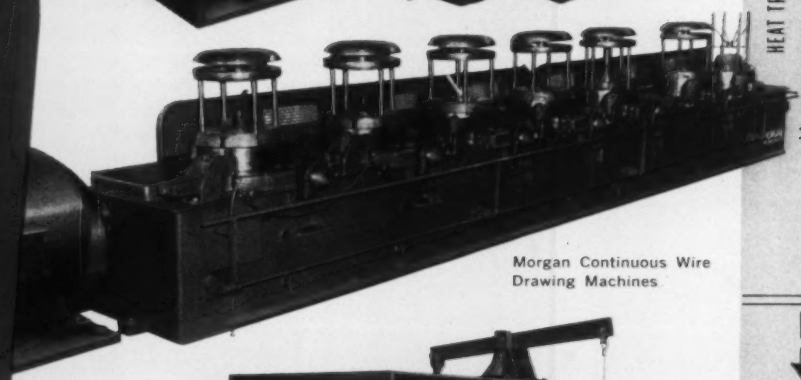
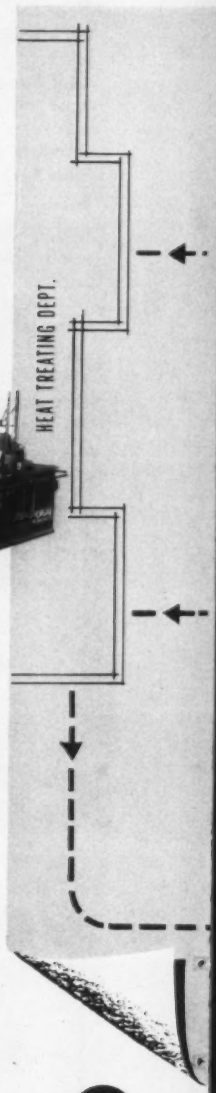
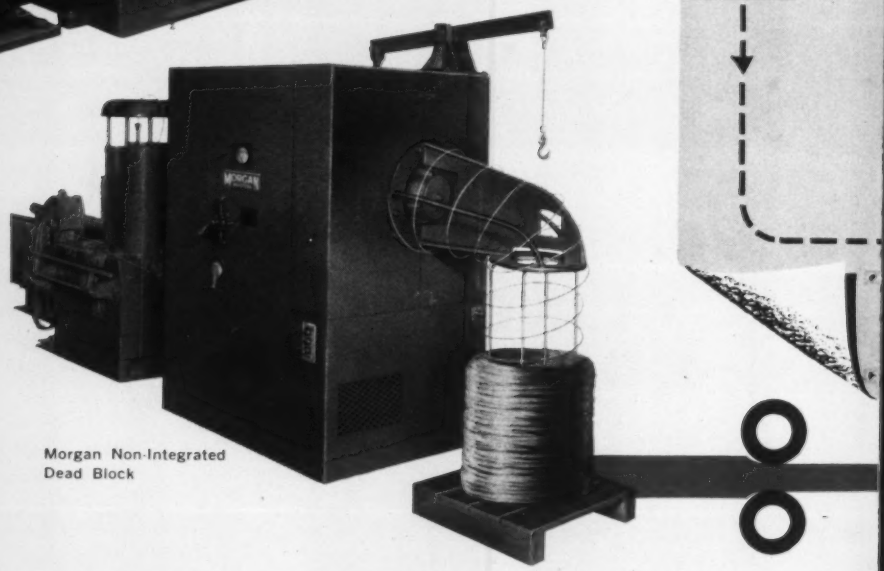


Mordraw Vertical Wire Blocks

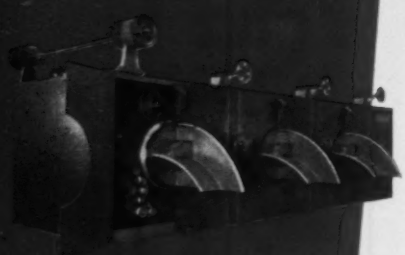


Morgan Continuous Wire Drawing Machines





Morgan Non-Integrated Dead Block



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problem from economic feasibility to long-range potential and will supply basic data for sound decisions.

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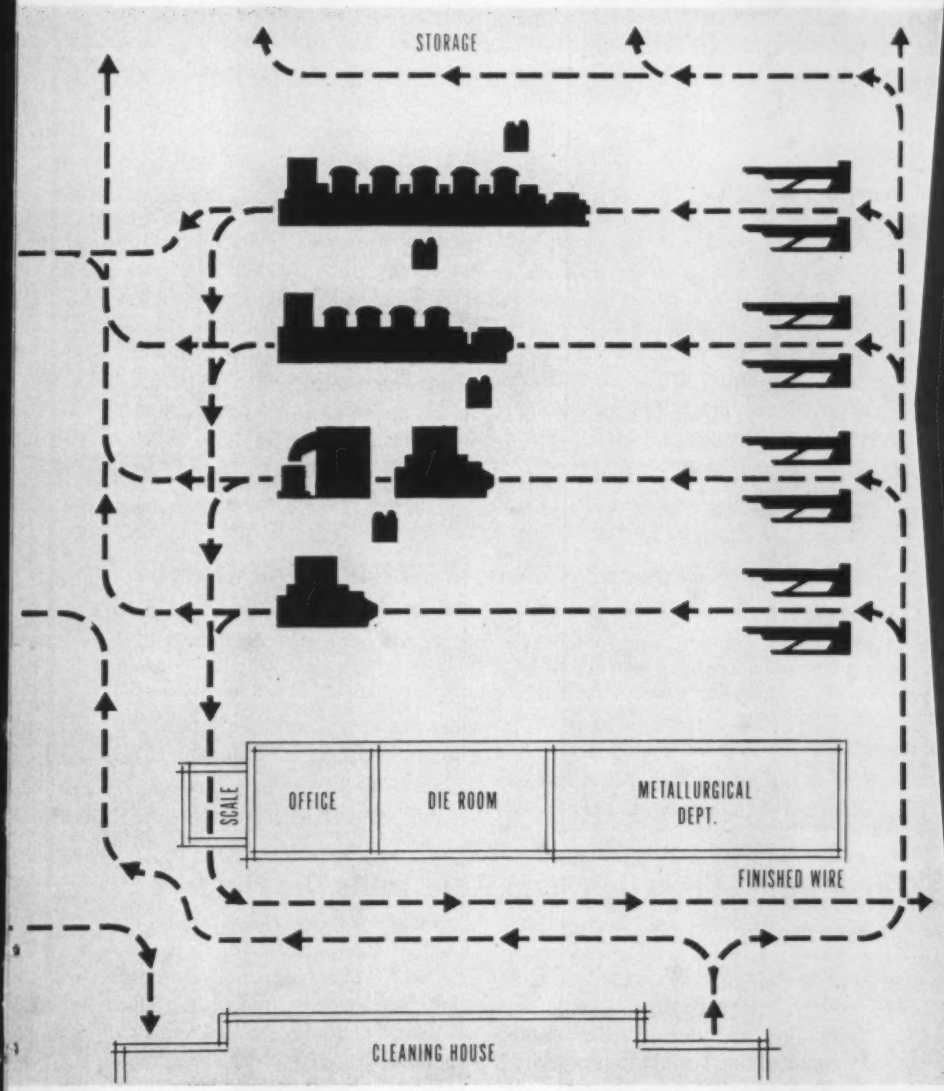

with the only WIRE MILL DESIGN & ERECTION SERVICE complete from study to start-up

MORGAN WORCESTER

CS-6

MORGAN CONSTRUCTION CO.

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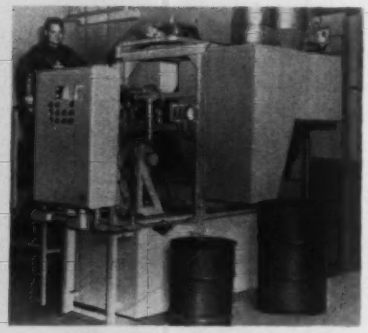
WIRE DRAWING MACHINES

COMBUSTION CONTROLS

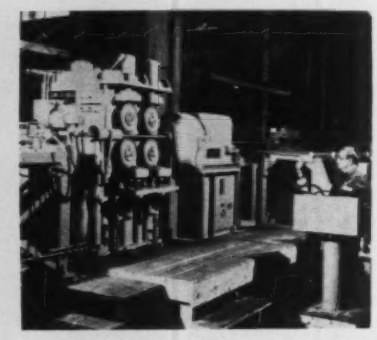
New Equipment and Machinery



Compact Drum Washer Features Automatic Cycle

Originally designed to clean new and reclaimed starter-drive components, a special batch-type drum washer is finding uses in many different fields for cleaning a wide variety of small parts. These parts fall through a chute into the drum where they're subjected to a high-pressure spray. During the washing cycle, the parts gently tumble in the drum so that all surfaces are exposed to cleaning action. Cleaning solution, oil, chips and impurities drain off through perforations in the drum. Then a pre-determined rinse cycle is followed by the drying cycle. An automatic timer controls the entire sequence of operations. (The Alvey-Ferguson Co.)

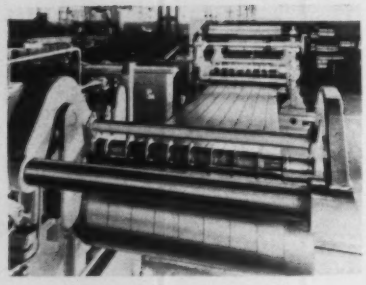
For more data circle No. 51 on postcard, p. 149



Tube-Turning Machines Handle High-Alloy Steels

Here's the first unit in a new line of high-speed, centerless, bar- and tube-turning machines designed specifically for carbide and ceramic tooling. In the smaller units, feed rates range up to 60 fpm; on larger machines 30 fpm is the maximum. All models feature a single cutterhead which uses mechanically-clamped tools. With this arrangement, eight cutting-edge changes are possible without resetting the cutters. It also eliminates all rubbing or friction guides in the cutter head. For high production, fully-automatic tables run a complete load of bars in an end-to-end, non-stop manner without any action by the operator. (Blaw-Knox Co.)

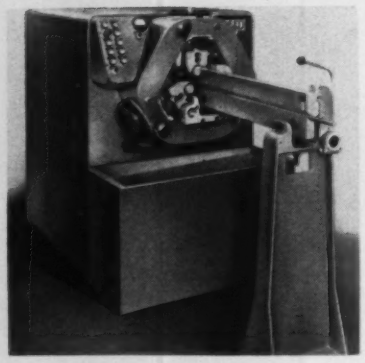
For more data circle No. 52 on postcard, p. 149



Overhead Separator Boosts Slitting-Line Output

Large, cumbersome separator disks, used for segregating slit coils, are no longer necessary with this new overhead separator on the job. It guides the slit strands of strip steel as they are wound on the recoiler. The separating mechanism consists of a steel shaft, supported parallel to and above the recoiler head. This shaft turns on anti-friction bearings. In operation, slit strips pass between ground-steel separator disks which are positioned on the shaft by Micarta spacers. (Production Machinery Corp.)

For more data circle No. 53 on postcard, p. 149

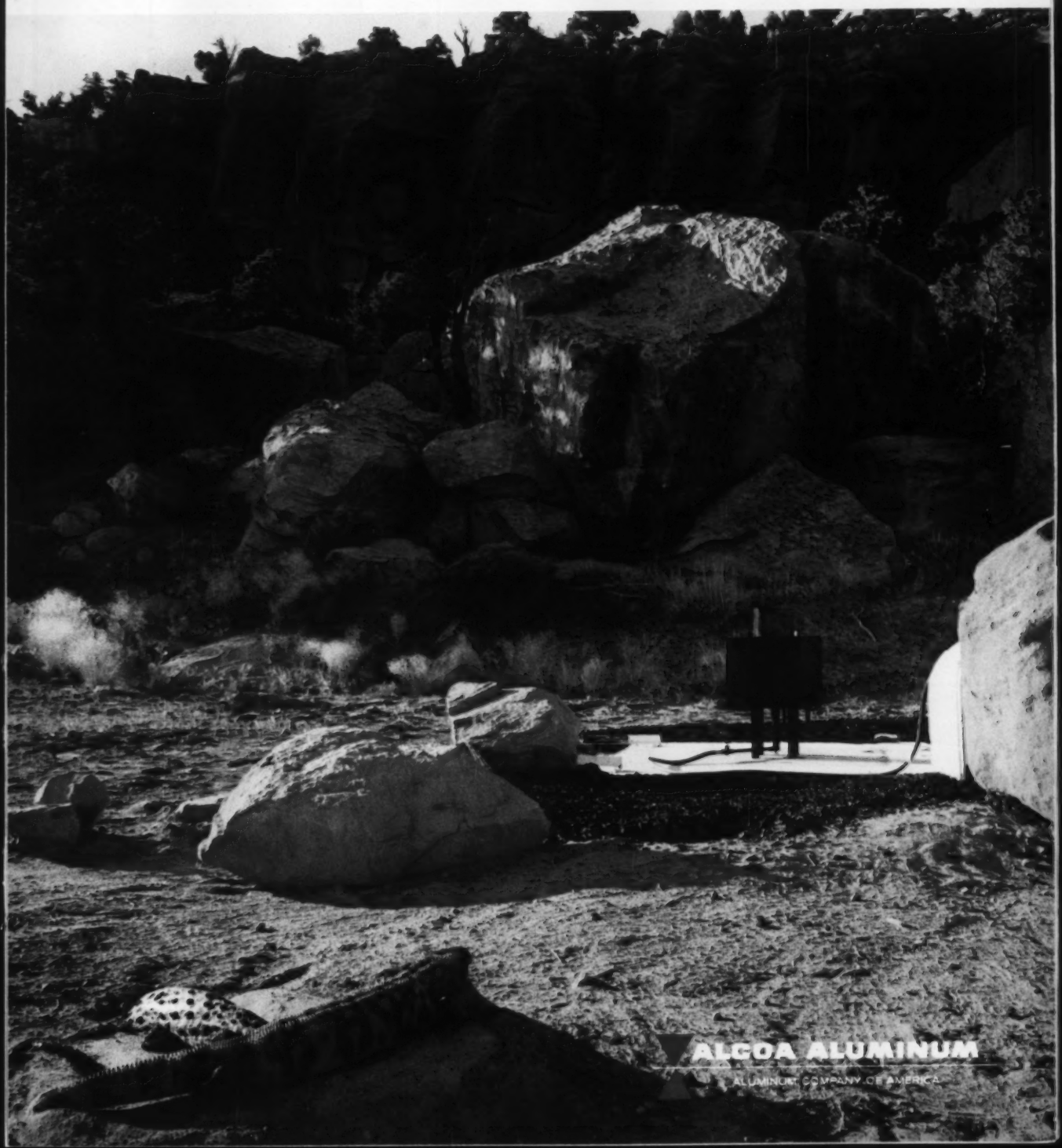


Thread-Rolling Unit Uses Adjustable Die Holders

A new thread- and form-rolling machine has been developed to meet the demand for a simple, rugged, through-feed unit. In its simplified form, this machine uses adjustable die holders that remain in the rolling position for continuous through-feed threading of long or short work. For workpieces with shoulders, a hydraulic system is available to retract dies from the rolling position. This permits return of the work to the front of the machine where it's unloaded. Taking advantage of unit construction, the manufacturer offers a variety of tooling to meet specific applications. However, the general purpose setup suits a wide range of work requirements. (Reed Rolled Thread Die Co., a subsidiary of Union Twist Drill Co.)

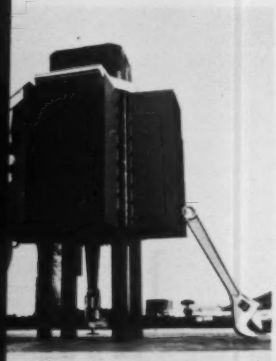
For more data circle No. 54 on postcard, p. 149

When a 37-lb generator converts heat directly to electricity . . .



When a 37-lb generator converts heat directly to electricity...

that's Alcoa Total Ability at work!



The metal structure in the picture at the left is 13 in. square and weighs 37 lb. It has no moving parts. Yet it will generate a steady 50 watts of electricity for years with no maintenance.

It's a Westinghouse thermoelectric generator being tested by El Paso Natural Gas Co. in a remote area of New Mexico. Its power is used for cathodic protection of underground gas well casings.

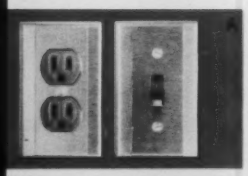
A gas flame burns in the core of the generator at 800°F. To convert the flame's energy into electricity requires a temperature differential of 580°F be maintained between the "hot" and "cold" ends of semiconductors less than an inch long. Only a highly efficient heat sink could do the job in this sweltering desert. Alcoa® Aluminum, with its remarkable heat-dissipating properties, was found to be the most economical answer.

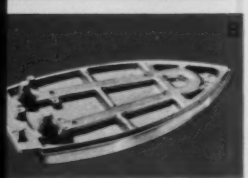
With Alcoa's help in alloy selection, black-anodizing and brazing techniques, Westinghouse engineers fabricated the finned heat sink for this prototype model from sheet. In production models, the heat sink will be extruded and the generator "core," which encases the gas flame, will be formed in an *impact press* from Alcoa powder-metallurgy alloys.

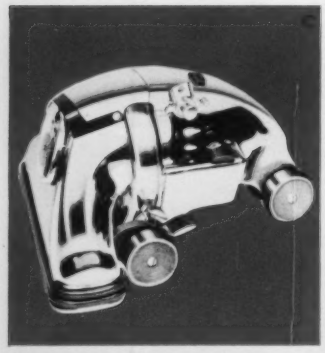
Chances are Alcoa can help you make savings and short cuts in your electrical manufacturing. We operate the world's most extensive light-metals research and development facilities. We are the only basic producer fabricating aluminum by every practical method. We have no axe to grind for any particular process. *Alcoa Total Ability* will help you select the right alloys and the most economical methods. Simply call your nearest Alcoa sales office, or write: Aluminum Company of America, 855-X Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA







ALCOA TOTAL ABILITY SERVES THE ELECTRICAL MANUFACTURING INDUSTRIES...

A. Tumbler switch and duplex receptacle produced by Leviton Manufacturing Company with Alcoa Aluminum satin finish wallplates.

B. Die-cast aluminum electric iron sole plate.

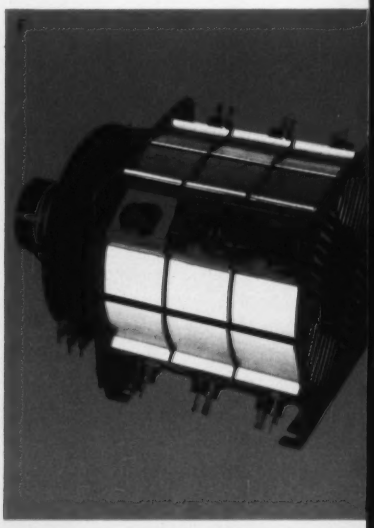
C. Kirby vacuum sweeper made by the Scott & Fetzer Co. Nozzle, headlight cap and shell housing are Alcoa die castings.

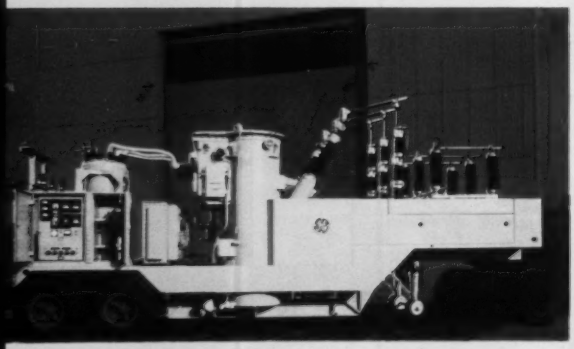
D. Mobile substation built by General Electric Company with aluminum transformer tank, coolers, switch framework and side panels.

E. All-aluminum reactor cages at a Philadelphia Electric Company substation.

F. DELTA-T Modular FCA-800 Semiconductor forced convection cooling package. One of many models with Alcoa Aluminum anodized extrusions by Wakefield Engineering, Inc.

G. A 60-ft radar antenna by D. S. Kennedy & Co. employs Alcoa aluminum tube and expanded sheet, has withstood ice loads over 5 in. and winds over 150 mph.

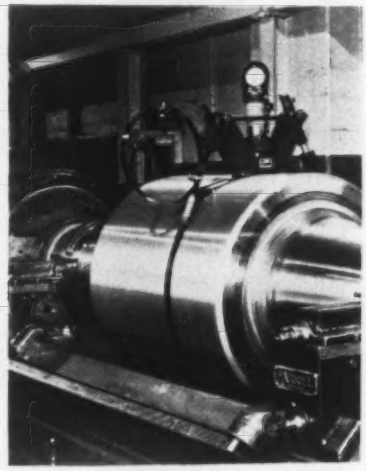




NEW EQUIPMENT

Cylinder Hardness

Combining portability with high accuracy and ease-of-use, a new cylinder-hardness tester offers many



advantages for gaging large cylinders. This instrument gages cylindrical pieces with diameters ranging from 12-36 in. Because of its easy portability the tester can be brought to the work instead of vice versa. This makes it particularly useful for checking out large pieces. (Wilson Mechanical Instrument Div., American Chain & Cable Co., Inc.)

For more data circle No. 55 on postcard, p. 149

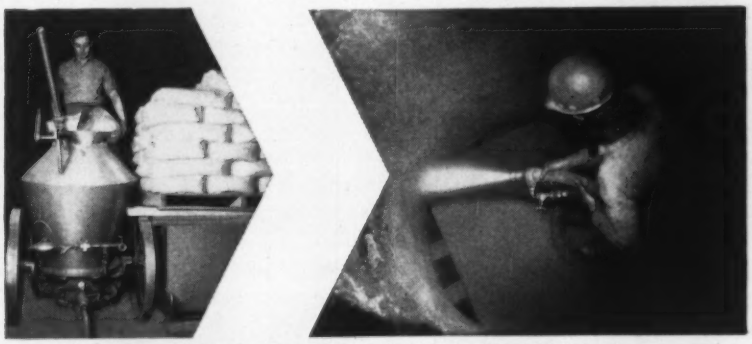
Pot-Type Furnace

Specifically engineered for melting and holding zinc, aluminum, magnesium, lead and Kirksite, as well as other nonferrous metals, a new line of pot-melting furnaces boasts low fuel consumption. High-grade insulated linings keep heat loss to a minimum. A new-style combustion chamber and flue-area design insure uniform circulation and even heat distribution over the entire pot surface. Single-valve control is standard. (J. A. Kozma Co.)

For more data circle No. 56 on postcard, p. 149

Metalfolding Machine

A new Twinfolding metalfolding machine utilizes a unique principle of operation to form a wide variety of sheet or coil materials. These in-



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applies adhesive strength of sand-cement layer in a continuous application!

Force sprays into every crack, crevice and corner for permanent strength in building, repairing or waterproofing concrete construction. Effective for sandblasting, when used without sand-cement mix. Completely dependable, both in operation and results. Has wide application in Steel Industries, Foundries, Refineries, Refractories, all Construction areas.

for details, write to
ALLENTOWN PNEUMATIC GUN COMPANY
1522 WALNUT STREET, ALLENTOWN, PA.
AREA CODE 215, HEmlock 3-4168

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wire in
special shapes

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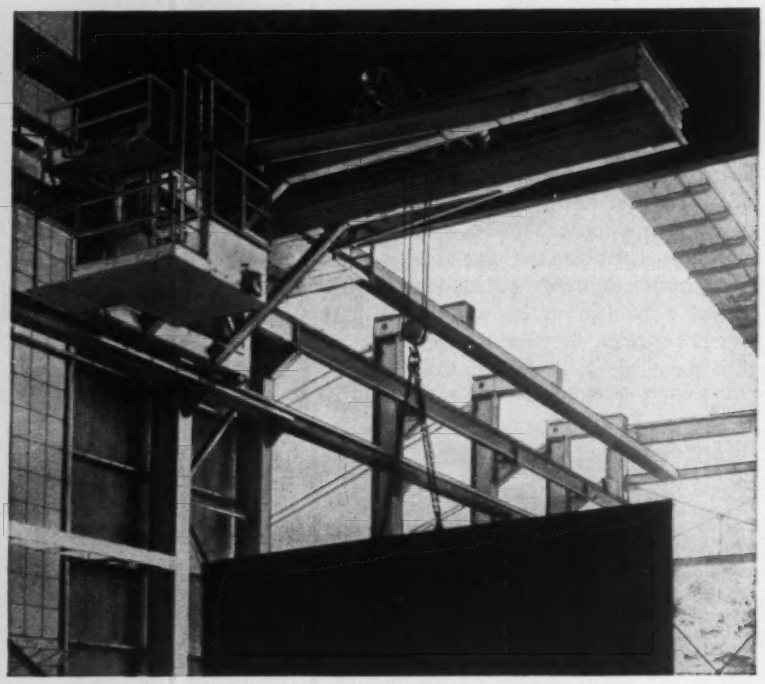
NEWCO means Quality

NEW ENGLAND HIGH CARBON WIRE CORP.
MILLBURY, MASSACHUSETTS

Offices and warehouses: Cleveland, Detroit, Los Angeles, Melrose Park (Chicago) and Millbury

SHEPARD NILES JOB-MATED CRANES:

DIFFERENT—because each job is different



Shepard Niles Cab Operated Wall Crane

This Shepard Niles Job-Mated QUALITY Crane was specifically designed for the actual job it is doing. Each component – motors, controls, frame, gearing, trolleys, brakes – was designed and built by Shepard Niles to give the best overall crane performance under unique operating and load conditions.

Your load-moving problem will receive this same careful consideration at Shepard Niles. Even in so-called "standard" applications, our insistence on selecting the right components to meet exact on-the-job conditions, results in a custom-built crane. Care like this in our plant means lower operating costs and increased efficiency in yours.

For the full story on how Shepard Niles Job-Mated Cranes can cut costs in your plant, arrange to have a Shepard Niles representative call at your convenience. Or send for our descriptive bulletin.

Member of Electric Overhead Crane Institute

America's Most Complete Line of Cranes and Hoists

SHEPARD NILES
CRANE AND HOIST CORPORATION

1468 Schuyler Ave., Montour Falls, N.Y.

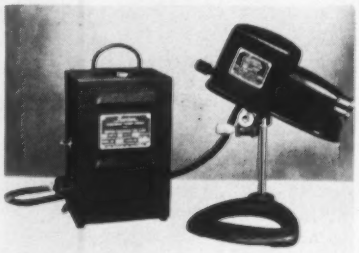
clude aluminum, stainless steel, brass, copper and titanium. The machine is also capable of processing non-metallic sheet materials. The

maker has established a policy whereby the machines can be had on a lease basis. Oftentimes the user does not have enough work to justify having a machine installed. However, with the lease system, the unit is available only when it's needed. (Twin Coach Co.)

For more data circle No. 57 on postcard, p. 149

Heat-Free Light

Here's a new lamp that generates a concentrated point source of light so intense its beam is virtually parallel. The 25-w lamp emits a heat-free beam of 15,000 footcandles per square inch. Its powerful light source lends itself to such special applications as microscope illumination or projection, photomicrograph, metallographs, lens testing, striation



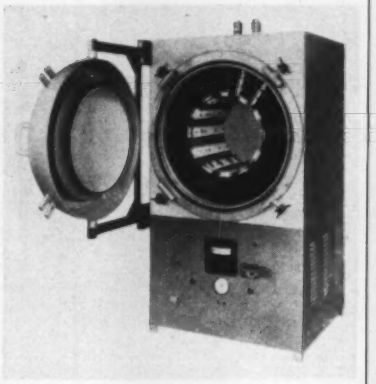
detection, optical comparators, transparency projection, spectrophotometers, contact printing, and copying. A special model is a powerful, compact, 2-w unit whose greatest dimension is 5 in. Yet it is complete with lamps and socket. It yields 46,000 footcandles per square inch from a light source only

0.003 in. in diameter. It can be used for collimating lenses and centering of any object (such as a gun sight or gun barrel). Other zirconium lamps are available from 10—300 footcandles. All are powered by a 115-v, 50-60 cycle ac power source. (Barton Mfg. Co.)

For more data circle No. 58 on postcard, p. 149

Vacuum Furnace

A new high-temperature vacuum-atmosphere furnace has been added to a line of versatile electric laboratory and industrial production furnaces and ovens. The furnace shown was designed for a maximum operating temperature of 2000°F at 29 in. Hg. vacuum—with an inert atmosphere containing a small percentage of hydrogen to provide a



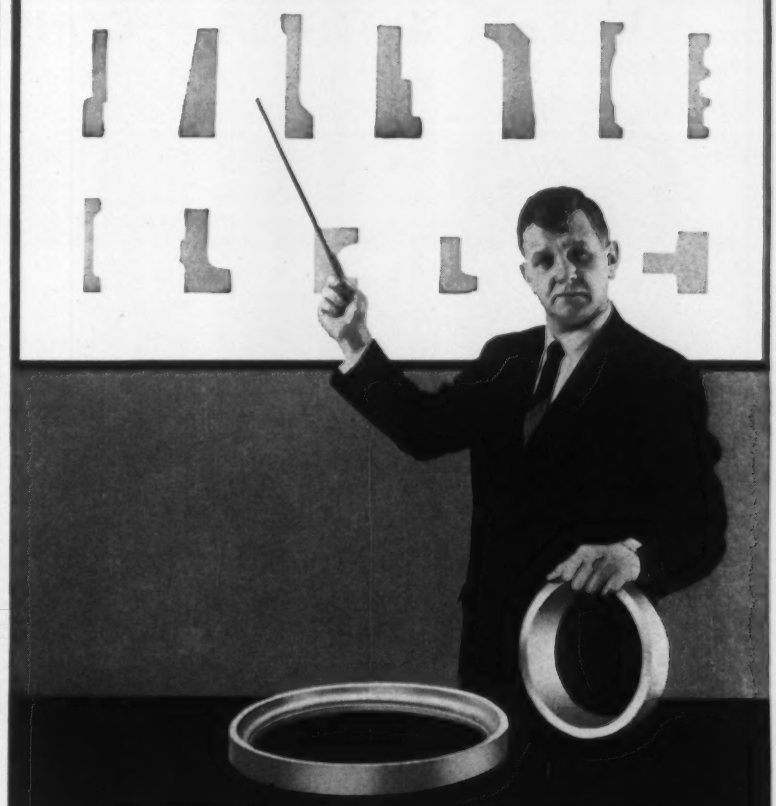
slightly reducing condition. Clear work space is 12 x 12 x 20 in. Alloy radiation shields are provided for insulation and the outer chamber is water-cooled. Heating elements are made of ¼-in. Kanthal rod. The vacuum pump, pump controls, power transformer and control instrument are all located in the base of the furnace, providing compact unitized construction. (K. H. Huppert Co.)

For more data circle No. 59 on postcard, p. 149

Surface Grinder

A new all - hydraulic surface grinder features a low pressure hydraulic power pack with electronic valve controls and double pump. The entire hydraulic package is contained in a handy pull-out drawer for easy maintenance. The double pump provides separate hydraulic

Typical profiles of Edgewater Rolled Steel Rings

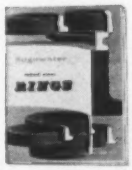


HERE'S AN IDEA TO HELP REDUCE "profit squeeze"

Buy rings that are formed so close to finished shape and dimensions that very little machining will be needed. The result—less labor, less scrap loss, lower overall cost.

Edgewater rings are forged from solid blocks of steel, and rolled by a powerful ring-rolling mill to required cross-section shapes (see typical profiles above). Close tolerances minimize finishing operations.

Edgewater rolled steel rings are of uniform quality, strong and tough. Diameters: from 5 to 145 inches. Send drawings for recommendations and prices.



INTERESTING description of the ring-rolling process is given in this brochure, **Edgewater Rolled Steel Rings.** We will be glad to send you a copy.

EDGEWATER STEEL COMPANY
P. O. Box 478 Dept. IA Pittsburgh 30, Pa.

The Porter Alloyist delivers the right alloy IN THE SPOTS THAT COUNT

There can be no compromise for instant, reliable communication when disaster strikes. That's why the Porter Alloyist recommends phosphor bronze and other special alloys for telephone and switchboard components. Contact springs and other vital parts made from these alloys deliver high electrical conductivity and resist deformation after repeated use.

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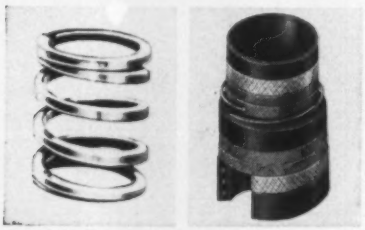
Porter's Riverside-Alloy Metal Division is your single reliable source for specialty alloys in 8 basic groups of wire, rod and strip . . . phosphor bronze, nickel silver, cupro nickel, brass, stainless steel, nickel, Monel and Inconel.

Ask for a free copy of "Alloys for Industry" describing our wide range of specialty alloys. Write H. K. Porter Company, Inc., Riverside-Alloy Metal Division, Riverside, N. J. Or contact our sales offices in Hartford, Chicago, East Orange, Atlanta, Cleveland, Detroit, Cincinnati, Los Angeles, and Rochester.



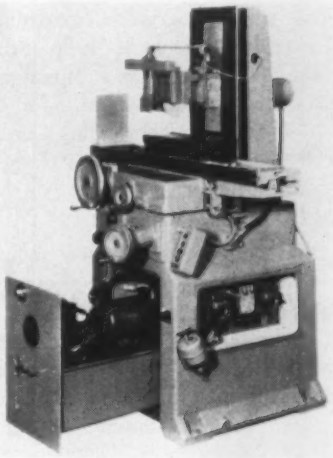
PORTER supplies stainless steel, "K" Monel and Inconel "X" wire for many types of springs.

PORTER carbon steel wire reinforces and lengthens the life of a wide range of industrial hose.

PORTER

RIVERSIDE-ALLOY METAL DIVISION
H. K. PORTER COMPANY, INC.

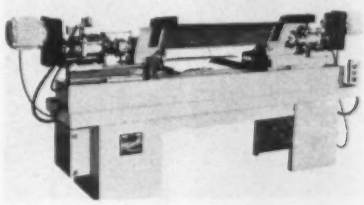
circuits for table and cross slide motions. The hydraulic system prevents troublesome air pockets from forming in the lines. With a unique feature, it's possible for the operator to switch from power to hand feed and back instantly with the flick of a lever. He can change to any combination of hand and power to the cross feed and table without stopping the grinder. (Reid Brothers Co. Inc.)



For more data circle No. 60 on postcard, p. 149

Thread-Rolling Machine

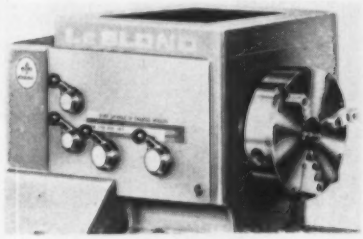
This double end thread rolling machine rolls threads on both ends of steel, aluminum, and brass rods at a rate of 3000 parts per hour (6000 threads). An operator is required only to place rods in the magazine storage arms; the machine automatically escapes, locates, clamps, thread rolls, unclamps and ejects the parts in proper sequence. Setup for various length parts can be made in a matter of minutes by moving either or both of the independent fixture-power feed unit assemblies along a full length aligning keyway. Fixture jaws are easily interchanged for various diameter parts. The rapid travel distances and thread feeding depths of the spindles are fully and infinitely adjustable. The machine can be operated single cycle or fully automatic. (Hause Machines, Inc.)



For more data circle No. 61 on postcard, p. 149

Lathe Can Be Converted

Would you like to buy a new lathe equipped with manual shift and know that you could convert it later to hydraulic shift at little more than the original factory price? You can do just that with this new lathes line, claims the maker. These medium duty lathes can be purchased with standard manual shift, and later be inexpensively changed in the field to hydraulic shift. A Servo-Shift "package" which fits inside the standard headstock makes such easy conversion possible. The Servo-Shift package consists of four elements: 1. A shift-control unit which fits neatly under the headstock cap (hand levers are removed and replaced by a single dial). 2. A crawl speed gear train which mounts on a built-in bracket at the end of the headstock. 3. A hydraulic motor-pump which mounts on the opposite side of the same bracket. 4. A small relay chassis which fits neatly among the standard electricals. (R. K. LeBlond Machine Tool Co.)



For more data circle No. 62 on postcard, p. 149

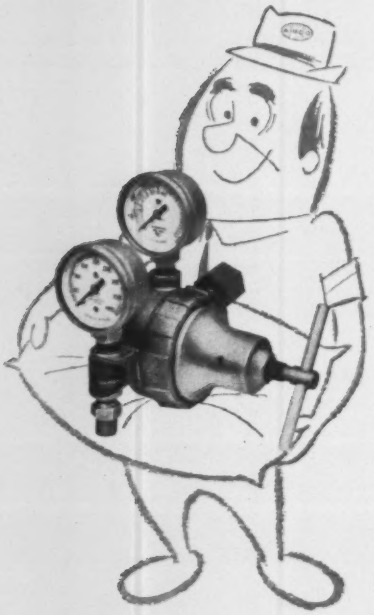
Induction-Heating Unit

Both research and production men should find a new electronic induction-heating unit of interest. It's quickly-installed, easy-to-maintain and capable of high-power output. Rated for continuous duty at 150 kw, the newcomer has sufficient reserve power built in to de-

Airco design scoop!—

NEW 9100 SERIES

INDUSTRIAL GAS REGULATORS



Top quality equipment at lower cost—for welding, cutting, brazing, heating

Inverse type seat design gives you the constant working pressure you need—right up to the cylinder's "empty" point . . . *Exclusive large diaphragm plate design* gives precise pressure regulation in a small regulator body—no bulky case required . . . *Phase dampening* keeps internal friction low, response to pressure change smooth and accurate.

This is Airco's new, full size, single stage 9100 Series—industry's finest industrial gas regulators at a new low price.

Phone your nearby Airco Distributor now. Let him fill all your welding and cutting needs. He's listed in your Classified Telephone Directory under "Welding Equipment and Supplies."

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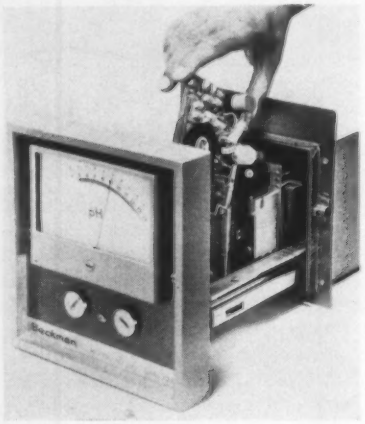
NEW EQUIPMENT

liver full output at distances up to 40 ft from the generator. Design features include uncomplicated installation, ready accessibility for maintenance, pushbutton operation, and output transformer that provides simple work-coil matching. Thermostatic controls keep raw-water consumption at a minimum. Installation dimensions are 54 x 91 x 82 in. (Induction Heating Corp.)

For more data circle No. 63 on postcard, p. 149

pH Analyzer

Marketing of an all new industrial pH analyzer system meets today's growing need for a wide range of determinations. So say the makers. The Model J pH Analyzer employs an AC stabilized amplifier which provides stability of 0.01 pH 24 hours over —20° F to +122°F ambient temperature range. Output accuracy and meter fidelity are ±0.2 pH for the full 0-14 pH range. The Analyzer is available with both milliampere and millivolt output for use with any potentiometric or current-type re-

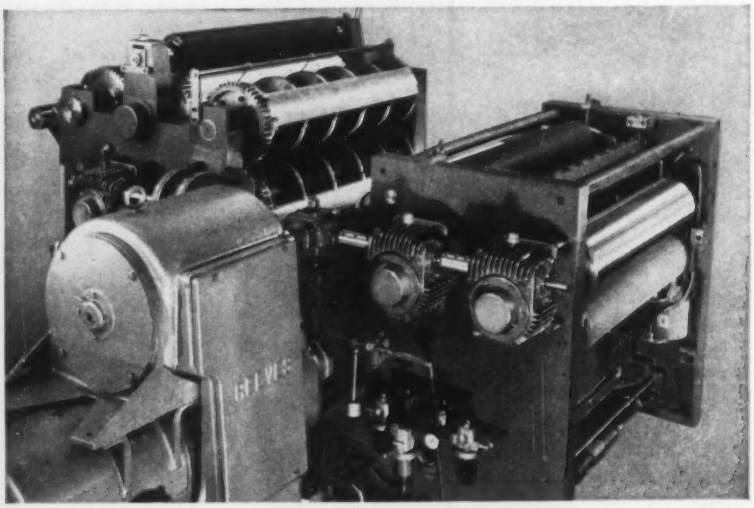


corder. It is also available with millivolt output only. (Beckman Scientific and Process Instruments Div.)

For more data circle No. 64 on postcard, p. 149

Optical Tooling

As the need for closer tolerances becomes more and more critical, manufacturers are turning to op-



Paster Pampers Printing Presses

Splicing a new roll onto an expiring ribbon of paper while it's moving 300-ft. per minute requires precise timing and accurate synchronization. This automatic butt splicer uses three Cone-Drive **double-enveloping worm** gear hollow shaft speed reducers to transmit the vitally important synchronized drive speed instantaneously and smoothly. The fact that these are standard, not special, reducers testifies to the high degree of accuracy built into every Cone-Drive unit.

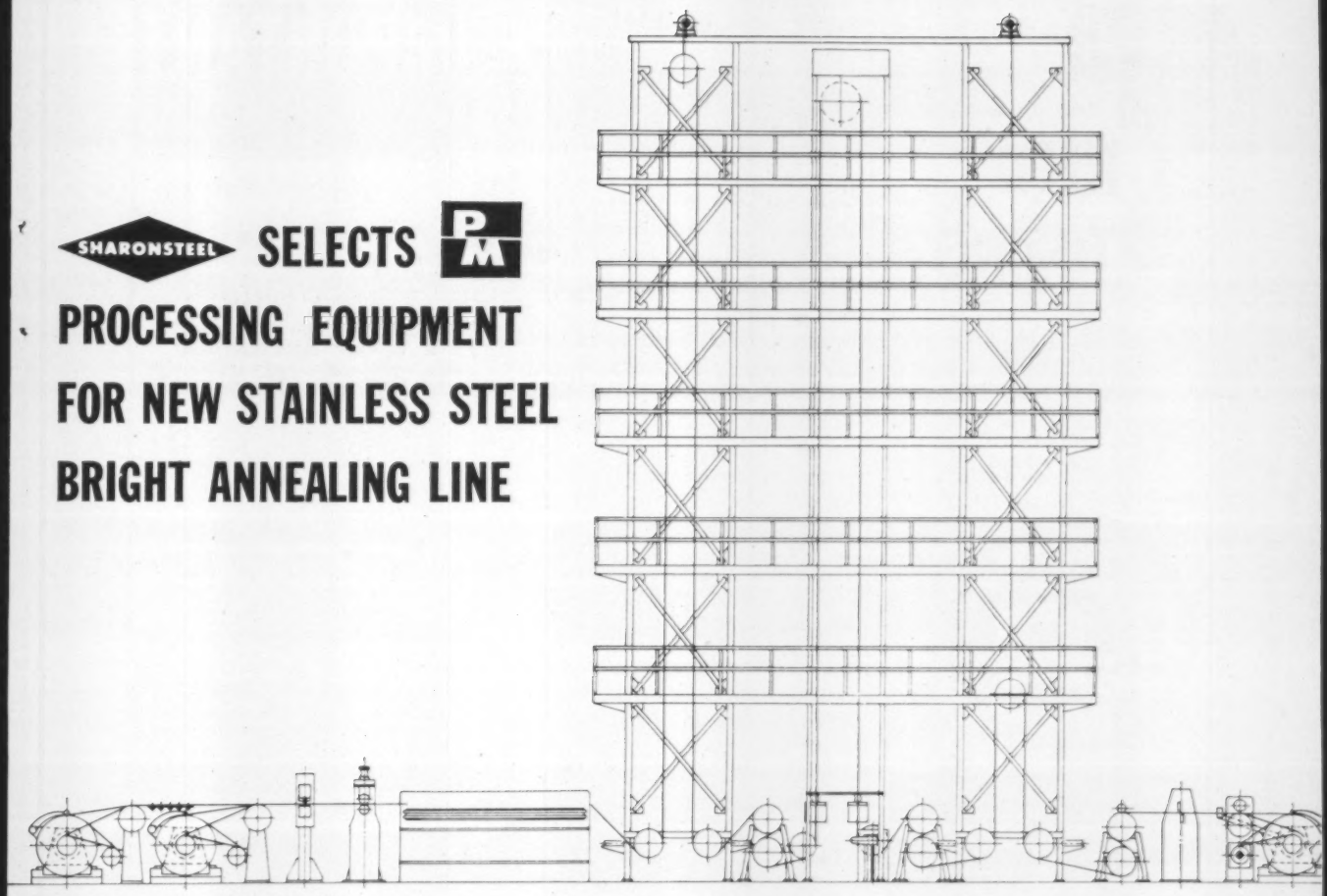
Accurate Cone-Drive gearing is available in gearsets, speed reducers and gearmotors.

CONE-DRIVE GEARS

DIVISION MICHIGAN TOOL CO.
7171 E. McNichols Rd., Detroit 12

SHARONSTEEL **SELECTS** P/M

PROCESSING EQUIPMENT FOR NEW STAINLESS STEEL BRIGHT ANNEALING LINE

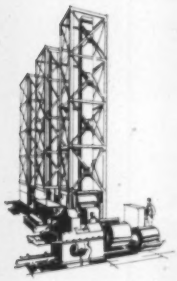


Today's most interesting development in the automotive trim market is the volume production of bright annealed stainless strip. Sharon's decision to adopt this process backs up their aim of providing a bright decorative strip that meets the most severe corrosion tests.

When Sharon Steel Corporation—one of the pioneers in stainless steel production—engineered their new, modern bright annealing line, they specified equipment designed and built by Production Machinery Corporation that will enable the line to give:

- stainless strip with a quality surface finish—protected by non-marking rolls
- continuous operation with minimum maintenance
- positive, sure strip tracking provided by 7 edge control points
- fastest coil handling and joining because of efficient, engineered equipment arrangement

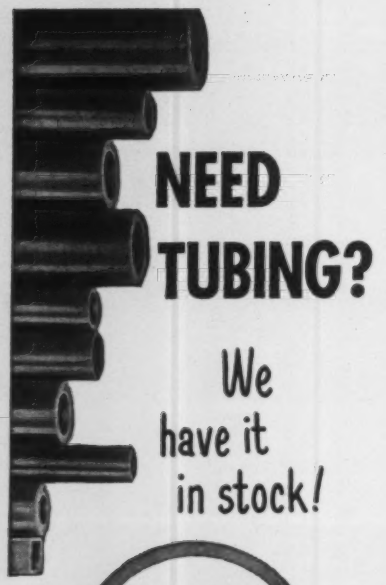
Remember, P/M will design and produce what you require—the way you want it—when you need it. Let our engineers show you what "productioneered" processing lines and equipment can do to cut operating costs in your plant—build increased profits.



Production Machinery Corporation
Mentor, Ohio

Designers and Builders of Metal Processing Lines and Equipment including: lines for pickling, annealing, slitting, shearing, and cutting-to-length, grinding, scouring, coil build-up, inspection, and other sheet and strip processing lines and machinery.

P/M®



NEED TUBING?

We have it in stock!

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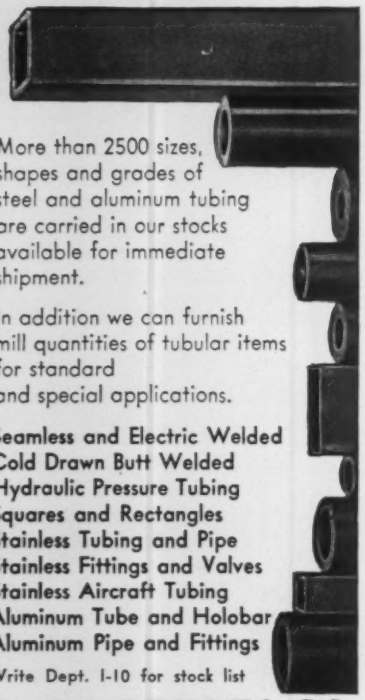

More than 2500 sizes, shapes and grades of steel and aluminum tubing are carried in our stocks available for immediate shipment.

In addition we can furnish mill quantities of tubular items for standard and special applications.

Seamless and Electric Welded
Cold Drawn Butt Welded
Hydraulic Pressure Tubing
Squares and Rectangles
Stainless Tubing and Pipe
Stainless Fittings and Valves
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NEW EQUIPMENT

tical tooling. With optics, many companies obtain tight tolerances quickly and efficiently. A multipurpose tool, which is in effect a 360-sided optical polygon, checks alignment and angular spacings in any multiple of full degrees. When it's used with an autocollimator or similar optical-sighting device, this optical polygon provides an accurate mirror surface which reflects a projected image of the sighting device's cross hairs. A magnifying glass makes viewing easy. And a magnet holds the instrument in the desired test position. (Michigan Tool Co.)

For more data circle No. 65 on postcard, p. 149

Vacuum Furnaces

Two new vacuum furnaces are one company's latest contributions to the field of vacuum metallurgy. The first, an induction-heated melting furance with a capacity of 50 lb, is designed for research and development work or for small-quantity production. The second new unit is cold-wall heat-treating furnace capable of operating at temperatures up to 3000°F. (F. J. Stokes Corp.)

For more data circle No. 66 on postcard, p. 149

Die-Casting Machine

Rated at 1300 tons of die-locking force, this huge die-casting machine actually tested out to 1600 tons in a standard strain-gage setup. With this equipment, large, complex aluminum castings are turned out to the highest degree of tolerance, structural density and finish. Gasoline-engine blocks, transmission housings, large control cabinets, gear boxes and lawnmower covers are just a few of the many products produced to exacting specs. Rugged construction accounts for this unusual capacity. Weight of the machine itself is the tipoff. It's in excess of 150,000 lb. Die platens measure about 5½ x 7 ft with 5-ft clearance. (Kux Machine Co.)

For more data circle No. 67 on postcard, p. 149

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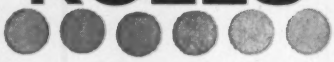

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Inventory Policies Slow Recovery

Steel consumers are now raising their sights on inventories. As a result, steel stocks are at a recession level.

This and the auto strikes have slowed the steel recovery.

■ Inventory policies of steel users are holding back the expected autumn rise in steelmaking.

Steel consumers are holding less than 12 million tons of steel, a recession level and about 4 million tons less than the stockpile at the start of 1959. Although a very mild rise in stocks is expected through November and December, little real accumulation or building of steel stocks is in sight this year.

Tonnage Lost — The failure of consumers to build stocks to levels that used to be considered normal will wipe out several million tons of steel from 1961 production. This threatens the industry goal of 100 million tons produced this year.

A second factor in the leveling of the market this month is the series of auto strikes that hit, first, General Motors, then Ford, and threatened Chrysler. There is no indication that automakers will try to make up for lost production. Instead, November orders for auto steel are no better than for October and December orders are not likely to show much improvement from November.

Psychological Effects — As is always the case in evaluating the auto picture, the situation could change. But there is no question that the timing of the strikes at new model introduction time has hurt more than expected. And the failure of the auto companies to attempt to recover lost time has had a bad psychological effect on the steel market.

Referring again to steel inventories, the continued emphasis by steel users on carrying low, and economical, stocks may be the start of a long-term trend. Users are confident of the mills' ability to turn on a dime and will not be coaxed into making a revision. Even the possibility of price increases failed to stimulate inventory building. Nevertheless, the elements of a first-class scramble after the first of the year are still present in the steel market. Regardless of current policies, as business continues to improve, users will have to add to inventory if only to keep the same number of "days" of steel on hand. Then, as the time of steel labor negotiations approaches, many users, as they have in the past, will start hedging against a steel strike.

Still Strong—In spite of the mid-autumn pause in the recovery, the prospects of continued improved steel production are unchanged. Overall market strength continues to gain as does the consumption of steel. However, a real burst in new orders and output is not now expected before early 1962.

Steel mills' ability to deliver promptly through almost four months of continual improvement of business may have a side effect of softening the impact of business cycles on the steel industry. Users are hesitant to build stocks and this, in turn, avoids inflation of steel demand. With orders running close to rate of steel consumption, there is absolutely no water in the rate of steel orders.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	112	108	114	92
Buffalo	104	104	103	82
Pittsburgh	107	109	101	69
Youngstown	102	101	97	79
Cleveland	127	143	134	94
Detroit	110	123	143	101
Chicago	111	114	111	91
Cincinnati	127	124	113	88
St. Louis	119	119	93	99
Southern	109	106	89	78
Western	119	119	112	89
U. S. Index	111.2	112.8	109.1	84.8

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	2,071	2,102	74,622	82,902
Ingot Index				
(1957-59=100)	111.2	112.8	97.7	108.5
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$38.83	$39.17	$39.50	$29.50
No. 2 bundles	$25.83	$26.17	$26.50	$20.17

Big View Is Needed by Buyers

P.A.s must broaden roles if further status gains are to be met, says head of professional development group.

H. A. Berry, a top railroad buyer, puts his ideas to work in his own company.

■ "I think the way a purchasing man talks about his own job is pretty revealing. Does he say, 'I'm a purchasing agent in my company.' Or does he say, 'I'm an executive officer of the company.'"

The speaker is H. A. Berry, manager of purchases and stores for the Chicago, Rock Island and Pacific Railroad Co. — more commonly known as the Rock Island Road.

Goal: Professionalism—As chairman of the Professional Development committee of the National Assn. of Purchasing Agents, Mr. Berry takes a close interest in how the P.A. looks at his own job. His goal is professionalism in purchasing.

The national committee headed by Mr. Berry is the most extensive one in the parent purchasing group. It consists of 17 division committees. Specific areas covered by these committees range from materials management, data processing, and make-or-buy to college doctoral research grants.

Some 250 colleges and universities work with the committee. More than 400 P.A.s devote volunteer time to the job. It's Mr. Berry's job to coordinate the efforts of this small army. And it's his fifth year at the helm.

Mr. Berry points out, "The purchasing agent's job is getting harder, not easier. Sure, there are a lot of tools that may make the buying job seem easier. And a lot has been written about them. It's not hard to get training in these tools.

BERRY: P. A.s are executives

"But now, the purchasing man is at the point when he must step into the hard, white light of corporate level life. He has to broaden his interests and extend his responsibilities. He has to stretch his brain."

Runs Course — Applying these ideas to his own area of command, Mr. Berry has Rock Island purchasing men take a weekly two-hour training course in purchasing theory and technique. He originally conducted the course, which runs from September through May of each year. In a kind of "each one teach one" adaptation of the original idea, trainees now conduct their own sessions. Each member prepares a lecture on some phase of purchasing method and delivers the talk before the entire Rock Island group.

As head buyer for the railroad, Harold Berry keeps tabs on a $13 million inventory in which about 50,000 items are rated as "active." About an equal number are rated "slow to almost nonmoving items."

Using data processing and value analysis, the Rock Island buyers have cut inventory levels to the lowest point in company history. They are sure they will make further cuts in the coming year.

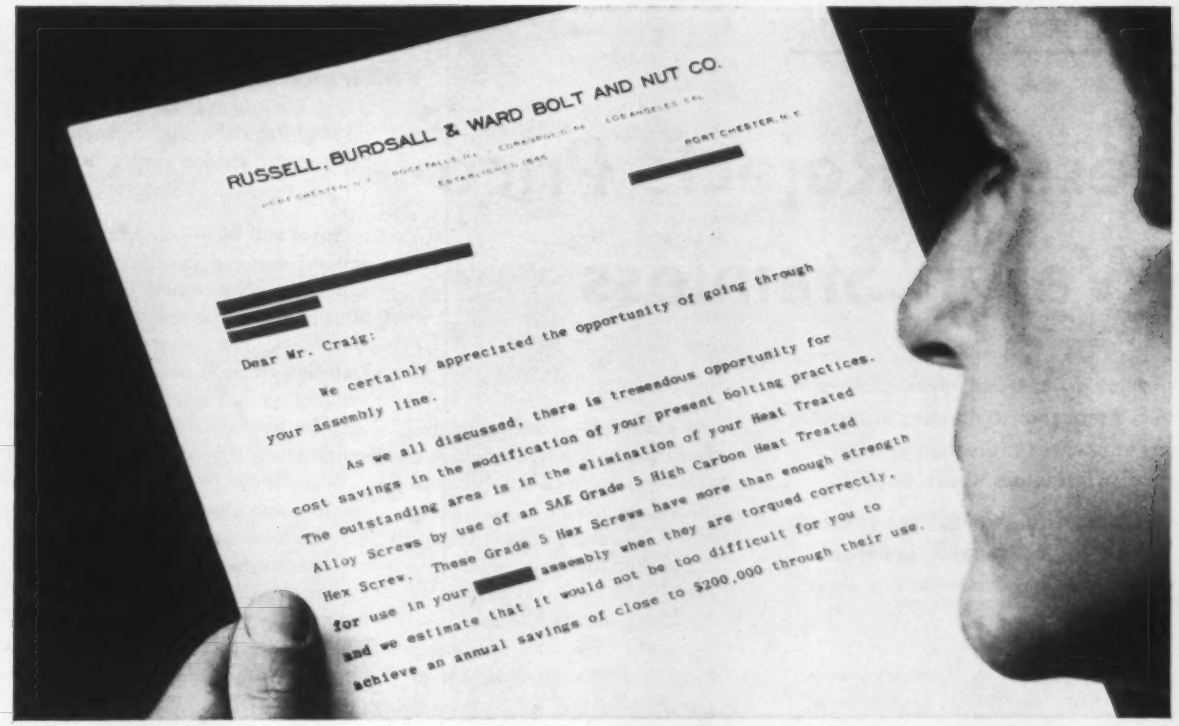
New Techniques — Of the new directions in purchasing, Mr. Berry comments, "Neither value analysis nor automatic data processing can be called brand new techniques. The problem is that, to many buyers, they seem newer than they should. Value analysis, I am sure, could cut anywhere from 3 to 30 pct of the cost of the individual buying programs in the average company."

The Rock Island has 28 value analysis teams, with a purchasing man sitting on each of them. With a limited amount of purchasing department manpower, it becomes necessary that each buyer sit in on four or five different VA groups. The point: Purchasing men are on the teams. And value analysis has become an integral part of all corporate procedure without losing its original starting point — the purchasing group.

The smaller committee groups are headed by a steering committee and, again, purchasing heads up this program. It's purchasing that indoctrinates vendors with the value analysis technique. This is done on the theory that a cut in vendor costs can mean a cut in costs to the buyer of their services.

Data Processing—On data processing: The Rock Island hired a systems analyst for the express purpose of adapting purchasing systems to data processing techniques. This year, for the first time, the Rock Island will run its total inventory on data processing equipment.

"Purchasing is a corporate window to the world," says Mr. Berry. "The buyer must present the corporate face to industry. He, and his management, can't afford to forget that fact."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As we all discussed, there is tremendous opportunity for cost savings in the modification of your present bolting practices. The outstanding area is in the elimination of your Heat Treated Alloy Screws by use of an SAE Grade 5 High Carbon Heat Treated Hex Screw. These Grade 5 Hex Screws have more than enough strength for use in your [redacted] assembly when they are torqued correctly, and we estimate that it would not be too difficult for you to achieve an annual savings of close to $200,000 through their use.

Eliminates big waste of dollars

Fastener value analysis study by RB&W reaps rewards without design changes

You see above an excerpt from a letter written to a large manufacturer by an RB&W technical advisor. Subsequently he submitted two detailed reports to document how savings could be achieved.

Because of the nature of the product involved, the manufacturer didn't want to make engineering changes. They preferred an alternative RB&W recommendation—substituting the proper standard screw in place of alloy screws—size for size. The cost reduction made possible: nearly $100,000 annually!

Opportunity for savings may not be so great at your plant. But they're bound to be worthwhile.

For instance, the difference in cost between a $\frac{3}{8}$ x 1 socket-head screw and a bright hex screw is about 5¢. Not much of a saving in itself. But suppose you use 150 of these socket-head screws in just one product. The saving is $7.50 per unit. If you produce 1000 units each year, that's savings of $7,500. With a line of ten such products, the *profits* saved would conceivably be $75,000 or more.

This is "value analysis" with a high dollar dividend. Take advantage of it by consulting with an RB&W Fastener Specialist. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Sales office and warehouse at: San Francisco, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas.

Jessop Rejects Price War in Stainless

Bucking a trend, Jessop Steel Co.'s warehouse division will not meet current discounts of 7.5 pct to stainless sheet buyers.

Company wants to return prices to "reasonably profitable levels." Other distributors slow to react.

▪ Sidestepping an industry-wide price war, the Steel Warehousing Div. of Jessop Steel Co. has decided it will no longer meet current competitive 7.5 pct discounts to stainless sheet buyers.

In addition, Jessop will use the published mill quantity extra charges applied to stainless sheets. This means the company will make no attempt to absorb such charges in order to get business.

Others Study Action—In effect, Jessop has decided not to sell stainless if it can't be done at a profit. Initial reaction from other distributors was lacking, although one outlet indicated it would like to see the discount reduced to 5 pct. Others, unofficially, recommended the Jessop move.

One warehouse indicated it might hold its present competitive position, but would review the situation before making any decision.

Discounted Since July—Stainless sheet has been weak for months. In July the first official price break came, with some large distributors announcing they would allow quantity discounts of 5 pct on sheets to meet competitive pricing at that level.

At the end of August another break came when distributors began allowing discounts of 7.5 pct.

Jessop's Policy—Jessop, in announcing its new policy, emphasized the move does not mean an increase in stainless base prices. "This merely returns stainless sheet prices to levels in effect earlier this year before the price war broke out," says Anthony J. Kueber, president of Jessop.

He added, "We are absolutely convinced that with the current level of prices, no distributor can market stainless sheets at a profit.

"There are only two alternatives. One is to return prices to a reasonable profit level, so that we can maintain stocks to serve customers. The other is to liquidate inventories drastically."

"Restore Rationality"—The second move, Mr. Kueber pointed out, could "create a hardship on customers who have relied on the steel center to furnish their requirements.

"We are choosing to try to restore some measure of rationality to this market. This same policy will apply to Jessop Steel of California, our Los Angeles-based service center."

The Jessop Steel Warehousing Division, sixth largest distributor in mid-U. S., also supplies stainless plates and bars, as well as a line of carbon and specialty steels.

PURCHASING AGENT'S CHECKLIST

Electronics heads for record sales year, outlook good for even better year in 1962. P. 106

Steel stocks held by users will rise slowly until end of '61, according to special forecast on inventories. P. 109

With the 7.5 pct discount to warehouse buyers, mills have been having great difficulty moving stainless. They are always at a competitive disadvantage in selling consumers as mills grant service center buyers a 10 pct discount on orders.

Sheet and Strip—Automotive and general demand continues to move sideways. November orders from auto plants are at about the same as October's. December bookings for **Detroit**-area customers are also sticking to that level. This tonnage may be increased, but mills are not counting on it.

Sheet mills in the **Chicago** area report some slowdown in buying in the last two weeks. Reasons given are the confused auto steel picture and possibly some hesitation by buyers who overbought in September. The slowdown is largely confined to hot- and cold-rolled sheet and bar products.

Most areas describe galvanized sheets as "strong." While some mills foresee a slight easing in demand, most are still booked well ahead. One large **Eastern** producer is now quoting December delivery.

Plates and Shapes—Buying moves along at an even pace, with little sign of any sharp stepup. October tonnage for many mills is about on a par with August and September. Users are talking about adding some inventory, but most orders are still for production use. Heavy plate remains the best in this market.

Wire—The uncertainty that surrounds the auto industry is hurting wire and rod. Construction products are easing off seasonally. October industry output will probably be about 65 pct of capacity, based on mill orders now in or expected. September was several percentage points below this because of auto strikes.

Pipe and Tubing—Demand for oil country seamless is lagging again. A large **Pittsburgh** supplier says oil producers are not even buying enough to keep up with depressed drillings. Mills believe there will be strike hedge buying next year.

COMPARISON OF PRICES

(Effective Oct. 16, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Oct. 16 1961	Oct. 9 1961	Sept. 18 1961	Oct. 18 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.49¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Oct. 16 1961	Oct. 9 1961	Sept. 18 1961	Oct. 18 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. Cents per lb‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$37.50	$37.50	$28.50
No. 1 steel, Phila. area	40.50	40.50	40.50	33.50
No. 1 steel, Chicago	38.50*	39.50	40.50	26.50
No. 1 bundles, Detroit	33.50	33.50	35.50	25.50
Low phos., Youngstown	41.00	41.00	43.50	29.50
No. 1 mach'y cast., Pittsburgh	45.50*	45.50	45.50	45.50
No. 1 mach'y cast., Phila.	49.50	49.50	49.50	49.50
No. 1 mach'y cast., Chicago	48.50*	49.50	50.50	41.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$38.83*	$39.17	$39.50	$29.50
No. 2 bundles	25.83*	26.17	26.50	20.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.00	31.00	31.00	33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	121.50†	121.125**	120.50	103.125
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	24.00	24.00	26.00	26.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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NEW ISSUE

September 29, 1961

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Market Continues Downward Shift

The scrap market continues soft with additional price drops reported.

Most areas expect it to become even softer. Buys are few and resistance strong.

▪ Despite the economic upturn and general industrial gains, scrap demand and prices continue to drop. It's the third straight week of falling prices and a weakening national market.

Domestic interest is still missing. There were only scattered mill purchases around the country this week. And these were for limited tonnage.

Dealers are holding back as prices fall. They are refusing to sell any large tonnages in anticipation of an upswing. However, there is a feeling that more drops may come before the downward trend reverses itself.

The Iron Age composite price for No. 1 heavy melting dropped to $38.83, from $39.17, on the basis of a price drop in Chicago. No. 2 bundles composite price dropped to $25.83.

Pittsburgh—The market is quiet and weak. In the only local activity, one mill is paying $26 and $27 for No. 2 bundles. Same prices were offered last week and this was taken by some to mean an end to downward adjustment. However, most signs point to further weakness. A mill in one nearby district has dropped out of the market. The price for prime scrap was lowered another dollar by a mill in another district. A mill on the fringe of the local district bought only a small amount of No. 1 heavy melting this month. Brokers say prices have been fairly stable here only because they were depressed in relation to other districts at the start of the current slide. New losses are considered inevitable, however, if there is no increase in buying volume over the next two weeks.

Chicago — Prices continued a downward drift in a dull market. Most suppliers began releasing larger amounts of material at reduced prices in the middle of last week. Until then, the softer prices offered for scrap tended to dry up the market. Volume is still low. But it has improved slightly.

Philadelphia — Export continues at a steady pace here, but export prices are dropping. No. 1 heavy melting export dropped $1; other grades fell as much as $2.50, in one export deal. Domestically, business is still at a standstill. Both brokers and dealers say further price drops seem certain.

New York—Steelmaking grades are lowered $1, on small sales that are expected to be confirmed by more representative tonnages. Dealers point out that domestic business hasn't been good for some time. There has been a definite easing in export demand.

Detroit—The market is mild with little buying or selling. Not much trading is expected before November lists close next week. Some No. 1 heavy melting is moving to the dock. Observers think next month's market will be even weaker. Tonnages offered by automakers should go up. Possibility of a strike at Chrysler Corp. is a question mark. But Ford's return to work will add greatly to scrap output.

Cleveland—Market has sagged as production lists more than fill area demand. A local mill is taking good tonnage of these and remainder is likely going out of the district. Big mills are still not interested, because of excess hot metal programmed in anticipation of better new steel market which hasn't developed yet. Foundry activity still slow.

Cincinnati—Market is somewhat softer with only one major buyer in the area. Outlook: Continued weak until new steel market pickup. Small tonnage of foundry grades is moving downriver at slightly higher prices.

St. Louis — Under pressure of plentiful supplies, key scrap steel grades dropped $1 for the second straight week. Mills are buying, but not pushing for scrap. Movement is good at lower prices.

Birmingham — Brokers say the market is very soft. A large electric furnace came back into the market with small purchases of No. 1 busheling and electric furnace bundles, at unchanged prices, but cut 3 ft and under $1 per ton. Cast market is particularly weak, with supplies plentiful.

Buffalo—Continued weakness in outside markets and lack of local business pushed prices down $2 on some grades. Cast scrap showed signs of strength, however, as Canadian buyers crossed the border to enter the local market.

Boston — The market continues very inactive. Domestic trade has dropped considerably. No. 2 heavy melting and No. 2 bundles were both off $1.

Houston—No price changes. But signs of weakness continue to dominate the market. Brokers expect a drop of $2 per ton in most grades. Export activity has fallen again.

West Coast — Prices continue weak. Dealers are pessimistic. They think prices will go lower. Export to Japan has slowed down. The few domestic mills in the market are buying very light tonnages.

SCRAP PRICES *(Effective Oct. 16, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	38.00 to 39.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	45.00 to 46.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	51.00 to 52.00
RR specialties	47.00 to 48.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	190.00 to 195.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 1 factory bundles	42.50 to 43.50
No. 2 bundles	24.00 to 25.00
No. 1 busheling	38.00 to 39.00
Machine Shop turn.	18.00 to 19.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	47.00 to 48.00
Low phos. punch'gs plate, ¼ in. and heavier	45.00 to 46.00
Low phos. 2 ft and under	43.00 to 44.00
No. 1 RR hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	48.00 to 49.00
Rerolling rails	60.00 to 61.00
Rails 2 ft and under	51.00 to 52.00
Angles and splice bars	46.00 to 47.00
RR steel car axles	59.00 to 60.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	41.00 to 42.00
Cast iron wheels	37.00 to 38.00
Malleable	45.00 to 46.00
Stove plate	35.00 to 36.00
Steel car wheels	44.00 to 45.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	95.00 to 100.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	29.00 to 30.00
Low phos. 5 ft and under	43.00 to 45.00
Low phos. 2 ft punch'gs	45.00 to 46.00
Elec. furnace bundles	44.00 to 45.00
Heavy turnings	27.00 to 28.00
RR specialties	45.00 to 46.00
Rails, 18 in. and under	54.00 to 55.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	43.00 to 44.00
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. 18 in. and under	42.00 to 43.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	34.00 to 35.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	45.00 to 46.00

Youngstown

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	38.50 to 39.50
No. 2 bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	40.50 to 41.50

Cleveland

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Cut structural & plates, 2 ft & under	40.00 to 41.00
Low phos. punch'gs plate	37.00 to 38.00
Drop forge flashings	36.00 to 37.00
Foundry steel, 2 ft & under	35.50 to 36.50
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	47.00 to 48.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	38.00 to 39.00
Malleable	49.00 to 50.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	105.00 to 110.00
430 bundles	85.00 to 90.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structural and plate, 2 ft and under	39.00 to 40.00
Rails 2 ft and under	50.00 to 51.00
Scrap rails, random lgth.	40.00 to 41.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.50 to 16.50
Shoveling turnings	17.50 to 18.50
Cast iron borings	26.00 to 27.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails random lengths	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
RR specialties	42.00 to 43.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	31.00 to 32.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	43.00 to 44.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rail, random lgth.	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	41.00 to 42.00
Stove plate	41.00 to 42.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	30.00 to 31.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Mixed bor. and turn.	5.00 to 6.00
Machine shop turnings	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	31.00 to 32.00
Drop forge flashings	31.00 to 32.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.50 to 31.50
No. 2 bundles	18.00 to 19.00
No. 1 busheling	30.50 to 31.50
Machine shop turn.	4.00 to 5.00
Shoveling turnings	9.50 to 10.00
Clean cast. chem. borings	17.50 to 18.50
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 30.50

San Francisco

No. 1 hvy. melting	....	$43.00
No. 2 hvy. melting	....	39.00
No. 1 dealer bundles	....	33.00
No. 2 bundles	25.00 to	26.00
Machine shop turn.	....	17.00
Cast iron borings	....	17.00
No. 1 cupola cast.	....	50.00

Los Angeles

No. 1 hvy. melting	....	$42.00
No. 2 hvy. melting	....	37.00
No. 1 dealer bundles	....	33.00
No. 2 bundles	25.00 to	26.00
Machine shop turn.	....	16.00
Shoveling turnings	....	16.00
Cast iron borings	....	16.00
Elec. furnace 1 ft and under (foundry)	....	50.00
No. 1 cupola cast.	47.00 to	48.00

Seattle

No. 1 hvy. melting	$43.00 to $45.00
No. 2 hvy. melting	38.00 to 40.00
No. 2 bundles	25.00 to 26.00
No. 1 cupola cast.	.... 36.00
Mixed yard cast.	.... 31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	....	$30.00
No. 2 hvy. melting cut 3 ft and under	....	27.00
No. 1 dealer bundles	....	31.00
No. 2 bundles	....	23.50
Mixed steel scrap	....	22.00
Bush., New fact., prep'd.	....	30.00
Bush., new fact., unprep'd	....	24.00
Machine shop turn.	....	8.00
Short steel turn.	....	13.00
Mixed bor. and turn.	....	12.00
Cast scrap	....	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$37.00
No. 2 hvy. melting	....	34.00
No. 2 bundles	....	24.00
Machine shop turn.	....	12.00
Shoveling turnings	....	15.00
Cut structural plate 2 ft & under	$44.00 to	45.00
Unstripped motor blocks	28.00 to	29.00
Cupola cast.	36.00 to	37.00
Heavy breakable cast.	28.00 to	29.00

U. S. Inches Toward Tin Council

President Kennedy's letter to Bolivia's President indicates the U. S. may join the International Tin Council.

It's the most positive indication yet.

■ Will the United States, world's largest tin consumer, join the International Tin Council?

There's a better chance now, say observers in Washington and world tin circles. And they are not just guessing.

Earlier this month, President Kennedy sent a note to President Paz of Bolivia about the U. S. plan to sell 50,000 tons of tin from its stockpile. The Bolivian leader was concerned that this would upset the market and drive down prices.

Consult First — World attention was focused primarily on paragraph three of the President's letter: "You can be sure, therefore, that we will sell no tin from our stockpile without first consulting with your government and the governments of other tin producing nations."

But in the next paragraph, President Kennedy said, "We hope to work with Bolivia toward a long-term solution to the problem of tin prices. It is to further this aim that we are now studying the terms of our accession to the International Tin Agreement to which Bolivia belongs and which the United States has not previously joined."

Firm Stand — This is the most positive statement yet by the U. S. government on the possibility of U. S. participation. But there were earlier indications.

Last year the Prime Minister of Malaya, world's largest tin producer, visited the U. S. He would not reveal specific details of the conversation with President Eisenhower. But his round-about comments left little doubt Malaya made the strongest plea yet for the U. S. to join ITC.

This year there were talks between executives of the International Tin Council and the executive branch of the U. S. government. Primary subject was supposed to have been disposal of surplus U. S. stocks. But the word now is that U. S. participation as a full member of the ITC came in for a share of discussion at the conference table and in private conversations.

Policy Shift — Why hasn't the U. S. joined ITC? Official reason is that it is, in effect, an international cartel and it is U. S. policy to avoid these.

Tin people point out that the aim of ITC is to support tin prices at profitable levels.

Primary tin buyers in the U. S. are steel companies, for tinplating. They have opposed U. S. participation. Why? A spot check of leading tin buyers in New York some time ago revealed that they feel the price would be from 7¢ to 15¢ per lb lower, at that time, were it not for ITC.

Strained Relations—What makes the U. S. consider joining now? For one, points out a Washington observer, the steel industry's relations with the Kennedy administration are somewhat more strained than under the Eisenhower administration. And the State Dept. is leaning toward joining to help cement relations with such leading producers as Bolivia and Indonesia.

There's something else. The U. S. has mountains of tin, far more than needed for strategic reasons. Prices are high. The International Tin Council buffer stock (metal moved on and off world markets to maintain supply and prices) is dry.

This combination of factors suggests ways could be found for the U. S. to move the metal at a profit, without stepping on anyone's toes.

The Drawback — Mitigating against membership is that the U. S. would then be subject to any decisions made by ITC.

Votes depend on tin activities of the country. Producers have a total of 1000 votes, as do consumers.

U. S. would undoubtedly have the biggest chunk of consumer votes. But it wouldn't be enough, considering producers, to swing any elections.

Tin Prices for the Week

October 10—121.625; October 11—121.25; October 12—121.25; October 13—121.25; October 16—121.50.*

* Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	24.00	26.00	9/25/61
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 187.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)
("F" temper except 6061-0)

Alloy	.030-.037	.047-.060	.076-.096	.154-.250
1100, 3003	47.4	46.4	45.4	44.4
5052	54.8	52.0	49.8	46.8
6061-0	53.0	50.3	48.4	47.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	13/32-1 3/4
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Munts Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base 30,000 lb. f.o.b. customer's plant)
Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb)...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York .....$188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.).....91.375
Thorium, per pg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
- 0.30 copper max. 23.25-23.75
- 0.60 copper max. 23.00-23.50

Piston alloys (No. 132 type)...25.00-26.00
No. 12 alum. (No. 2 grade)...21.25-21.75
108 alloy 21.75-22.25
195 alloy 24.25-24.75
13 alloy (0.60 copper max.)...23.00-23.50
AXS-679 (1 pct zinc) 21.50-22.50

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 22.75-23.75
Grade 2—92-95% 21.50-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 19.50-20.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¼
Yellow brass	20⅜	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27½
No. 2 copper wire	25½
Light copper	23¼
*Refining brass	24¼
Copper bearing material	23¼

*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27½
No. 2 copper wire	25½
Light copper	23¼
No. 1 composition	24½
No. 1 comp. turnings	24
Hvy. yellow brass solids	19
Heavy yellow brass turnings	18
Radiators	20½

Aluminum

Mixed old cast	12	—12½
Mixed new clips	14	—14½
Mixed turnings, dry	13	—13½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	24	—24½
No. 2 copper wire	22	—22½
Light copper	19¾	—20¼
Auto radiators (unsweated)	16¼	—16½
No. 1 composition	20½	—21
No. 1 composition turnings	20	—20½
Cocks and faucets	16¾	—17¼
Clean heavy yellow brass	14¼	—14¾
Brass pipe	16½	—17
New soft brass clippings	18¼	—18¾
No. 1 brass rod turnings	16	—16½

Aluminum

Alum. pistons and struts	7	— 7½
Aluminum crankcase	9½	—10
1100 (2s) aluminum clippings	11¾	—12¼
Old sheet and utensils	9½	—10
Borings and turnings	4½	— 5
Industrial castings	9	— 9½
2020 (24s) clippings	10½	—11

Zinc

New zinc clippings	5	— 5¼
Old zinc	3	— 3¼
Zinc routings	1¾	— 2
Old die cast scrap	1¾	— 2

Nickel and Monel

Pure nickel clippings	56	—58
Clean nickel turnings		43
Nickel anodes	56	—58
Nickel rod ends	56	—58
New Monel clippings	26	—26½
Clean Monel turnings	18½	—19
Old sheet Monel	25	—25½
Nickel silver clippings, mixed		20
Nickel silver turnings, mixed		17

Lead

Soft scrap lead	7¼	— 7½
Battery plates (dry)	3	— 3¼
Batteries, acid free	2	— 2¼

Miscellaneous

Block tin	90	—92
No. 1 pewter	65	—67
Auto babbitt	46	—47
Mixed common babbitt	10	—10½
Solder joints	15	—15½
Small foundry type	9	— 9½
Monotype	9¼	— 9¾
Lino. and stereotype	8½	— 8¾
Electrotype	8	— 8¼
Hand picked type shells	5¾	— 6¼
Lino. and stereo. dross	1¾	— 2¼
Electro dross	2½	— 3

(Effective Oct. 16, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective Oct. 16, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6, S15*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.' * COKES: 1.50-lb. add 25¢. ** ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*			Hollowware Enameling 29 ga.—7.85 *U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City.		
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3, Y1.*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1†† R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢. †† 7.425 at Sharon; Niles is 7.225.

(Effective Oct. 16, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3, S15*		7.70 *B5*	6.725 *B3,R3, S15*	9.025 *B3,B5, S15*	8.30 *B3*	5.30 *B3*				8.00 *W6, S15*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, W15*		9.025 *A5, C13,W13*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,W13*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.10 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Oct. 16, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
S15 Seaway Steel Div., Roblin-Seaway Ind., Inc., North Tonawanda, N. Y.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
W13 Western Cold Drawn Steel, Div. of Standard Screw Co., Elyria, O.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.36	10.16	11.35	9.70	9.95	9.75	11.80	17.48	16.48	21.58	20.83
Birmingham		9.11	11.00	11.39	10.10	9.06	9.12	8.91	13.14	18.84	16.65	22.94	22.19
Boston**	.10	10.02	10.50	11.62	12.50	9.93	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.28	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.33	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	10.65	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	8.00	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[3]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.63	12.85	18.59	16.68	22.69	21.04
Milwaukee**	.15	9.51	10.49	10.42	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.68	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.85	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	10.66	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	8.97	9.64	10.79	11.14	8.81	9.32	8.97	11.64	.....	16.69	21.79	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—½" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 1/16"; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅜"; cold drawn—15/16" to 2⅜" round; Hot-rolled 4140—⅝" to 2⅜" round, cold drawn—15/16" to 2⅜" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Oct. 16, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)	
Plain finish—packaged and bulk	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

(Minimum plating charge — $10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Pipe & tubing, coke prices & cast iron water pipe index will appear in Oct. 26 issue.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25-21.50	—	19.75-21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	26.75	29.25-26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	31.50	35.00-31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	42.25	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	29.75	33.25-29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R5*; Harrison, N. J., *D3*; Youngstown. *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6*; Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Newark, N. J. *D2*; Harrison, N. J., *D5*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago. *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown. *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*: Claymont, Del; *P2*.

Forging billets: Ambridge Pa., *B7*; Midland Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

f.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

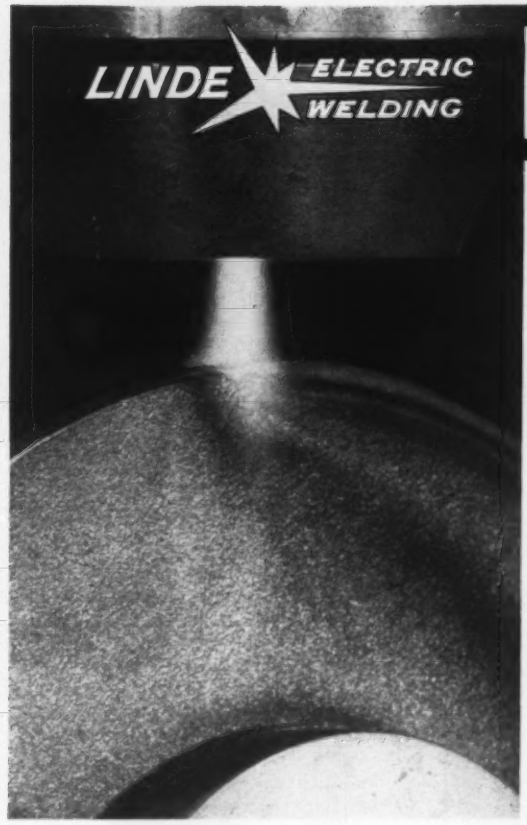
	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Oct. 16, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Chicago *W7*	173	...	...	...	...	9.00	9.55†
Cleveland *A6*	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	9.00	...
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	...
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
Sparrows Pt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	...

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.



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- Deposits as narrow as 1/8-in., as wide as 1 in. or more.
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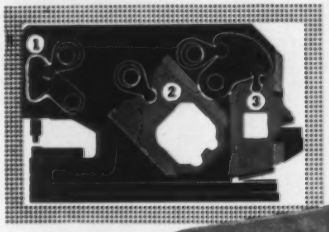
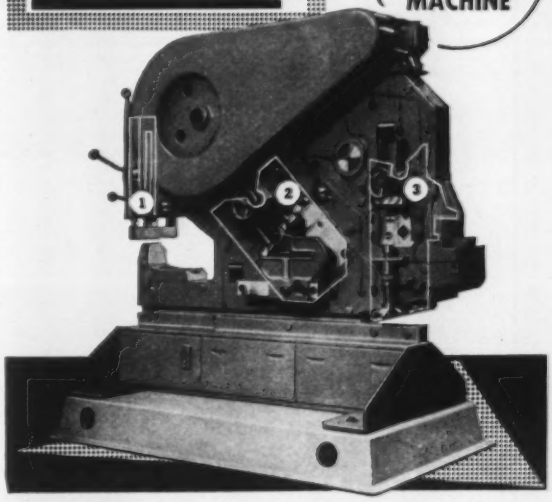
DIAMOND Manufacturing Co.
Wyoming (Wilkes-Barre Area) Pa.



3 CLUTCH MACHINE



MUBEA UNIVERSAL IRONWORKER

Sizes Jr., #0, #½, #1½, #2½
Immediate delivery in your area
Write for brochure and nearest dealer

E. G. Heller's Son, Inc., 7039 E. Slauson, L.A. 22, Calif.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	10.10	6.875	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	7.025	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10	.....	.....	.....	.....
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Cutle, Pa. *M10*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

- Rolled elliptical, 18 in. or longer, 5000 lb lots 44.50
- Electrodeposited, 5000 lb lots.... 37.50
- OFHC anodes, 3 in. diam. (5000 lb) 42.50

Brass, 80-20, ball anodes, 2000 lb or more 51.50

Zinc, ball anodes, 2000 lb lots 18.25
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.05
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.60

Tin, ball anodes $1.26 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

- Copper cyanide, 100 lb drum, N. Y.. 65.90
- Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45
- Nickel sulfate, 5000 lbs 31.00
- Nickel chloride, freight allowed, 100 lb 47.50
- Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80
- Zinc cyanide, 100 lb, N. Y. 61.50
- Potassium cyanide, 100 lb drum Chicago, del'd east of Rockies... 46.50
- Chromic acid, flake type, 10,000 lb or more, N. Y. 30.94

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

- Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
- Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
- Carbonyl Iron (200 lb lots) 88.00
- Welding Grades 8.10
- Cutting and Scarfing Grades 9.85
- Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

- Electrolytic, domestic, f.o.b. shipping point. 15.00†
- Atomized ..... 44.3 to 62.3
- Reduced ..... 15.00†
- Chemically Precipitated 45.5

Brass, 5000-lb lots ..... 33.1 to 50.3

Bronze, 5000-lb lots ..... 51.5 to 56.8

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum .....$3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 56.0 to 68.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 15.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten, carbide grades... $3.25

Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	.....	.....
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type 302	.....	.....	.....	37.50
304	28.80	31.55	34.30	39.75
316	42.20	46.25	50.25	58.25
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	.....
410	22.70	24.85	27.00	.....
430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective Oct. 16, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

- Super duty, Mo., Pa., Md., K7.... $185.00
- High duty (except Salina, ..., add $5.00) 133.00
- Medium duty 125.00
- Low duty (except Salina, Pa., add $2.00) 103.00
- Ground fire clay, net ton, bulk... 22.50

Silica Brick

- Mt. Union, Pa., Ensley, Ala. $158.00
- Childs, Hays 163.00
- Chicago District 168.00
- Western Utah 183.00
- California 185.00
- Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. 163.00-168.00
- Silica cement, net ton, bulk, Chicago 26.75
- Silica cement, net ton, bulk, Ensley, Ala. 27.75
- Silica cement, net ton, bulk, Mt. Union, Pa. 25.75
- Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

- Standard chemically bonded, Baltimore, Md. $620.00
- Gary, Ind. 658.50
- Standard, Pascagoula, Miss. 647.50
- Standard chemically bonded, Curtiner, Calif. 119.00
- Burned, Baltimore 585.00

Magnesite Brick

- Standard, Baltimore $715.00
- Chemically bonded, Baltimore 655.00
- Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅜ to ½-in. grains
Per net ton

- Domestic, f.o.b. Baltimore in bulk. $73.00
- Domestic, f.o.b., Pascagoula, Miss... 80.00
- Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
  - in bulk 43.00
  - in sacks 52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:

- Pa., W. Va., Ohio $16.75
- Missouri Valley 15.60
- Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

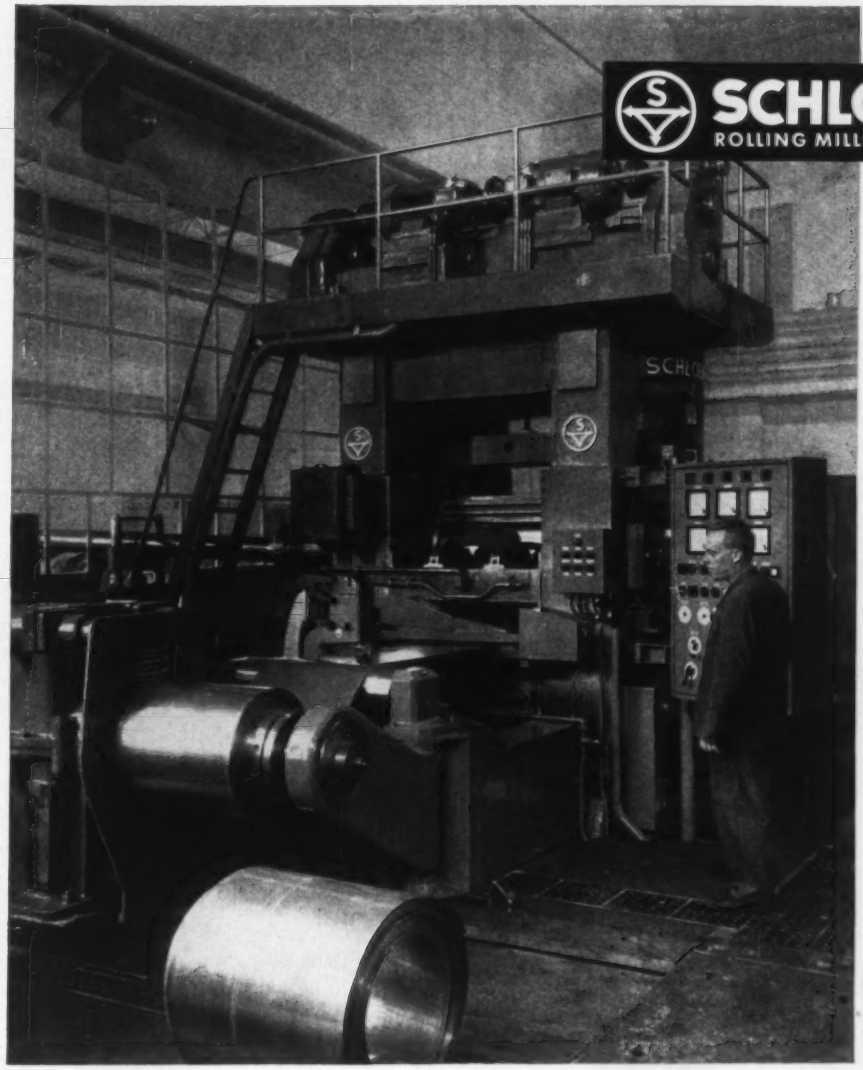
GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
Ohio Seamless Tube Div., Copperweld Steel Co.*	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

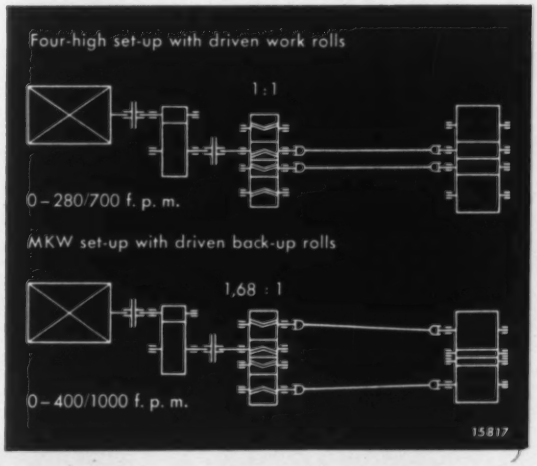
* Electricweld only.



MKW cold rolling mill for 25 in. wide strip

MKW Rolling Mills
High Production, Ready Adaptability

SCHLOEMANN-designed mills for cold rolling narrow and medium strip are equipped for multi-purpose application with a two-high set-up for roughing and an MKW set-up featuring unilaterally supported work rolls in conjunction with driven back-ups for finish-rolling. A four-high set-up with driven work rolls can be used for roughing wide strip. This means that the diameter of the work rolls can be selected to best suit the particular rolling program.



FELLER ENGINEERING COMPANY 1190 Empire Building, Pittsburgh 22, Pa.

AVAILABLE IMMEDIATELY

1—COMPLETE BAR MILL. 16" Breakdown and 6-Stand 10" United Mill with 900 Rolls, Re-Heat Furnace, 110 Ft. Hot Bed Shears, Tilting Table & Cradles. Roll Shop. Main Motors 2200 volt AC current.

1—15-Ton Top Charge Electric Furnace. 4000 KVA Transformer, 13,000 volts.

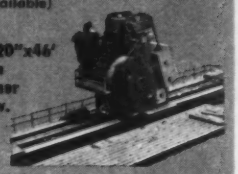
20—8" Dia. x 4"/6"/8" Face 2-Hi Cold Mills with 25 H.P. Motors 230 v. DC. Edge Rollers, Coilers, etc.——complete.

2—10" Dia. x 10"/16" Face 2-Hi Cold Mills with 40/65 H.P. Motors 230 volts DC. Edge Rollers, Coilers, etc.—complete.

CURRY & HUDSON ASSOCIATES, INC.
NO. 1 GATEWAY CENTER
PITTSBURGH 22, PENNSYLVANIA

MESTA PLANER 14½'x14'x42', Four Heads, 150 HP Variable Voltage Drive.
NILES PLANER 15'x14'x36', Four Heads, 150 HP Variable Voltage Drive.
(4 of each available)

NEWTON 120"x46' Combination Rotary Planer & Cold Saw.



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1 ton x 11'8" Shaw-Box 1946 DC
3 ton x 19'9" Shepard-Niles 1943 DC
5 ton x 45'0" Shepard-Niles AC 1945
5 ton x 45'0" P&H DC 1941
7½ ton x 107'0" Whiting AC 1949
10 ton Cantilever crane 35'0" span 1943 AC
10 ton x 28'0" Shaw-Box 1941 DC
10 ton x 45'0" Bedford 1941 DC
10 ton x 75'0" Northern 1925 AC
10 ton x 67'0" P&H 1942 DC
15 ton x 79'1" P&H 1942 DC
20 ton x 28'10" Shaw-Box DC 1946 DC
25 ton x 99'0" Leonard Burke 1943 AC

Ornitz Equipment Corp.
Industrial Engineering Service
595 Bergen St. Brooklyn 38, N. Y.
NEvins 8-3566

Upswing Continues Steady in Detroit

Used machinery dealers in Detroit report steady gains after the summer doldrums.

Sales and profits are expected to climb in the fourth quarter, with the upswing carrying into 1962.

▪ Used machinery sales in Detroit have picked up in the last eight weeks.

The future looks promising to dealers, since the recent increase in activity follows the normal summer dry spell. The upswing is traced to a higher level of industrial activity throughout the country, and mounting optimism by manufacturers.

Steady Rise—Dealers are cautious. They do not see a boom, but rather a slight continuous rise over recent levels. Outlook for the fourth quarter seems brighter than the third, both in sales and profits.

The uptrend is expected to swing into 1962. So far, 1961 has been on a par with 1960 for many Motor City dealers.

Price increases are possible. But this isn't a sure bet. There has been a certain amount of recent price stiffening. Rising demand for machinery at the wholesale level has been a contributing price factor. Prices are now a bit above a year ago.

Supply Lack—Some dealers feel the government has been slowing down used equipment releases. This means fewer machines available than earlier this year.

Other dealers contend there still is plenty of government equipment around. They say nothing short of a shooting war could cut down the total of used tools awaiting buyers.

Good Stocks—Practically every Detroit dealer has a hefty supply of machines in stock. Inventories remain high and varied.

Dealers, as a result, are more selective about what they purchase. This doesn't mean they aren't looking. Nor are they intentionally trying to cut inventories. Big supplies mean a dealer has a better chance to make a sale.

Varied Sales—Although trends vary, drilling machines are now on the rise and moving well. Milling machines have been holding their own. There hasn't been too much enthusiasm for grinders and production lathes.

During the summer, there was a lull in auctions. Larger plants avoid them when interest and prices tend to be on the low side.

Now that fall is here, a few more auctions are being lined up. But there has been no real change in the number of plant closings or bankruptcies in this area.

"They sure decentralized us!"

LIQUIDATION PLATE ROLLING MILL

Mill Facility, Equipment and Material of the former Phoenix Steel Corp. Plant located at Harrisburg, Penna.

LOCOMOTIVES

(1) 20 Ton Plymouth Diesel 36" Ga. Cummins
(1) 20 Ton Plymouth Gasoline 36" Ga. LeRoi

MILL DRIVE

RPM OUTPUT

(1) 3,000 HP General Electric Slip Ring Motor, 2,300 Volt, 60 Cy., 3 PH., 356 RPM with Comp. panel, and lub. system, air wash sys.

ELECTRIC ARC MELTING FURNACE

HEROULT Model 15 Electric Arc Melting Furnace. Shell Diameter 14'-0"; Inside Diameter 12'-0" Side Charge. Cold scrap charge 30,000#/40,000#. Electrode size 14" diameter x 60" long. Transformer General Electric 6,000 KVA Primary Voltage 13,200/26,400 Sec. 265/92 volts; built in reactor. GE Automatic Control Panel. Westinghouse tot. encl. drawout switch-gear. With approx. 160 spare electrodes and nipples, door frames, rings, motors, etc. S/N 236 Mfd. Heroult Div. U. S. Steel Corp.

SHEARS

1,000 Ton HOT UPCUT SLAB SHEAR Capacity 6" thick x 60" wide, stroke 12½", 8 cuts per min, 32" hyd. hold down cylinder, 1320# w.p., 600 HP Bingham Pump and motor drive. Auto. Length of cut gauge, adj. from 30"/120" length of cut. Approach and runout tables, crop kickoff, operator pulpit, relate and control panels. Man. Pittsburgh Engineering and Machine Co.—1949.

TRANSFORMERS

(1) 7,500 KVA Wstghse. 66,000 Pri. 13,800 Sec 3 PH 60 S/N 4089566 Yr. 1948.
(3) 2,000 KVA GE 13,200/26,400 Pri. 2,400/4,150Y, Sec. 1 PH 60 S/SN 2871432; 2871433; 287140.
(3) 667 KVA GE 2,300/4,000Y Pri. 460 Sec. 1 PH 60 S/N 4497213; 4497214; 4497215.

ROLLING MILL EQUIPMENT
SLAB EDGER MILL

(1) Slab Edger Mill, Pittsburgh Engr. Co., S/N 48147 (New 1949). Capacity 72" x 18" thick slab, Roll Size (2) 43" Diameter x 24" Working Surface—Alloy Steel. Motor Drive 1,000 HP & reduction gear. Complete with starter, Controls, Etc. (1) MG Set, General Electric 1,000 KW, Generator-600 V DC 1667 Amperes. Motor—1,400 HP 2300/3/60.

(1) Birdsboro 34" Blooming and Slabbing Mill, 72" Wide, 2 High, Reversing, 28" x 66" Ingot. Minimum Thickness 2", Maximum Lift 28", Maximum Ingot Weight 30,000# (Approx.), Approach Table 38' Long, Runout Table 20' Long. Both Tables Motor Driven 50 HP 230 V DC; Hydraulic Slab Shear. Pittsburgh Engr. Co., S/N 48148, New 1949: Capacity 1,000 Tons, 8" Thick x 60" Wide Steel Slab (Hot); Hydraulic Pump, 8 Stage Bingham, 500 gpm @ 1,440 psi, Motor Drive—600 HP 2,300/3/60, Starters, Controls, Etc.

(1) Birdsboro 128" Plate Rolling Mill, 126" Wide, 3 High 34" Dia. Rolls, 15" Maximum Lift, Minimum Thickness 3/16", Maximum Slab or Ingot Size 115" Wide x 15" Thick, Maximum Weight 22,000# (Approx.), Tilting Tables, Front and Back; 3,000 HP Electric Motor Mill Drive. Runout Table 54' Long to Plate Leveller; Plate Leveller, 11 Driven Rolls (5 Upper and 4 Lower), 148" Between Housings. Motor Drive—60 HP 230 V DC.

(2) Plate Levellers, 6 Upper and 5 Lower Work Rolls, Motor Drive—55 HP 230 V DC.

(1) Birdsboro 42" Universal Plate Rolling Mill, 2 High, Reversing, Maximum Lift 26", Maximum Width 42", Minimum Width 7", Minimum Thickness ¼", Maximum Weight 14,000# Ingot (Approx.). Vertical Side Rolls each side of Mill Housings for Rolling Plate Width. Front Mill Table 45' Long.

OVERHEAD TRAVELLING CRANES

(1)	150 Ton/40 Ton Morgan	Ladle Crane 59'-8" Span
(1)	40/25 Ton Milwaukee	Crane (1951) 59'-6" Span
(1)	25 Ton Milwaukee	Crane (1949) 88'-0" Span
(1)	20 Ton Milwaukee	68'-4" Span
(2)	20/5 Ton Shaw Box	65'-0" Span
(1)	20 Ton Milwaukee	Crane (1949) 48'-10" Span
(1)	15 Ton Northern	68'-3" Span
(2)	15 Ton Morgan	64'-6" Span
(1)	10 Ton Alliance	70'-0" Span
(1)	10 Ton P & H	68'-3" Span
(1)	10 Ton Shaw Box	69'-4" Span
(1)	10 Ton Shaw Box	64'-8" Span
(1)	10 Ton Alliance	64'-6" Span
(1)	10 Ton Milwaukee	65'-0" Span
(2)	10 Ton Alliance	60'-0" Span
(4)	10 Ton Alliance	58'-6" Span
(1)	5 Ton Alliance	64'-6" Span
(2)	5 Ton Alliance	81'-8" Span
(1)	5 Ton Cleveland	56'-6" Span
(1)	5 Ton Northern	44'-6" Span
(2)	5 Ton Alliance	40'-4½" Span
(1)	5 Ton Phoenix Stl.	38'-0" Span
(1)	15 Ton Milwaukee	Bridge Only (1949) 70'-0" Span

Spare Trolleys, 5 ton, 10 ton 15 ton; contractor panels; cab controls; Resistance banks.

EDGE TRIMMING AND SLITTING SHEAR

Capacity 96" wide x 7'16" thick plate. Arbor 12" diameter, circular cutters 16" diameter x 2⅜" face. Cutting speed adjust to 62 fpm Drives 65 HP, 250/1,000 RPM, 230 volt, DC., with operator's pulpit, controls, etc. Mfd. by Monarch Tool & Die Co., Milwaukee, 1949. Approx. wt. 80,000#.

METALLURGICAL HOT BLAST CUPOLA

Rated 15/20 tons hr. Shell dia. 8'-11"; hearth dia 7'-0"; stack height 40' (12) water cooled tuyeres 3.81" dia. Heat exchanger for preheating 12,000 CFM to 960/1000°F, with Allis Chalmers blowers, motors, controls. Charging equipment, cyclone dust collector, piping, valves, operating and control instrumentation. Installed 1954.

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NEW CENTRIFUGAL CASTING MACHINES
MFD. BY NATIONAL SUPPLY. NEW 1942-1946

36" pipe cap. x 18' long max., min. 8" x 18' long. (1) 10" pipe x 12' long max. Min. 2" x 12' long. Water cooled. Complete w/aux. equip., motors, pushers, pouring car, etc. Write for photos. 90 DAY guarantee.

VERY REASONABLE. TERMS.

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4400 KW RECTIFIERS
consisting of:
4—1100 KW Allis Chalmers
MERCURY ARC RECTIFIERS
Electrical Characteristics

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Primary: 33,000 V. 4160 V. 2300 V.
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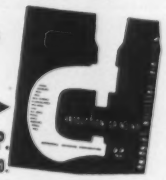

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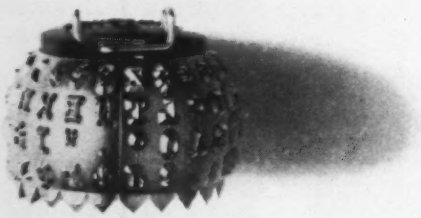

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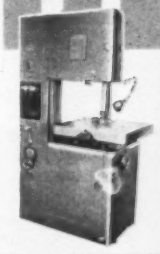

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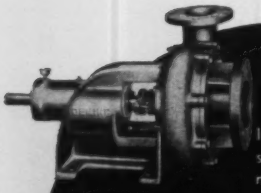

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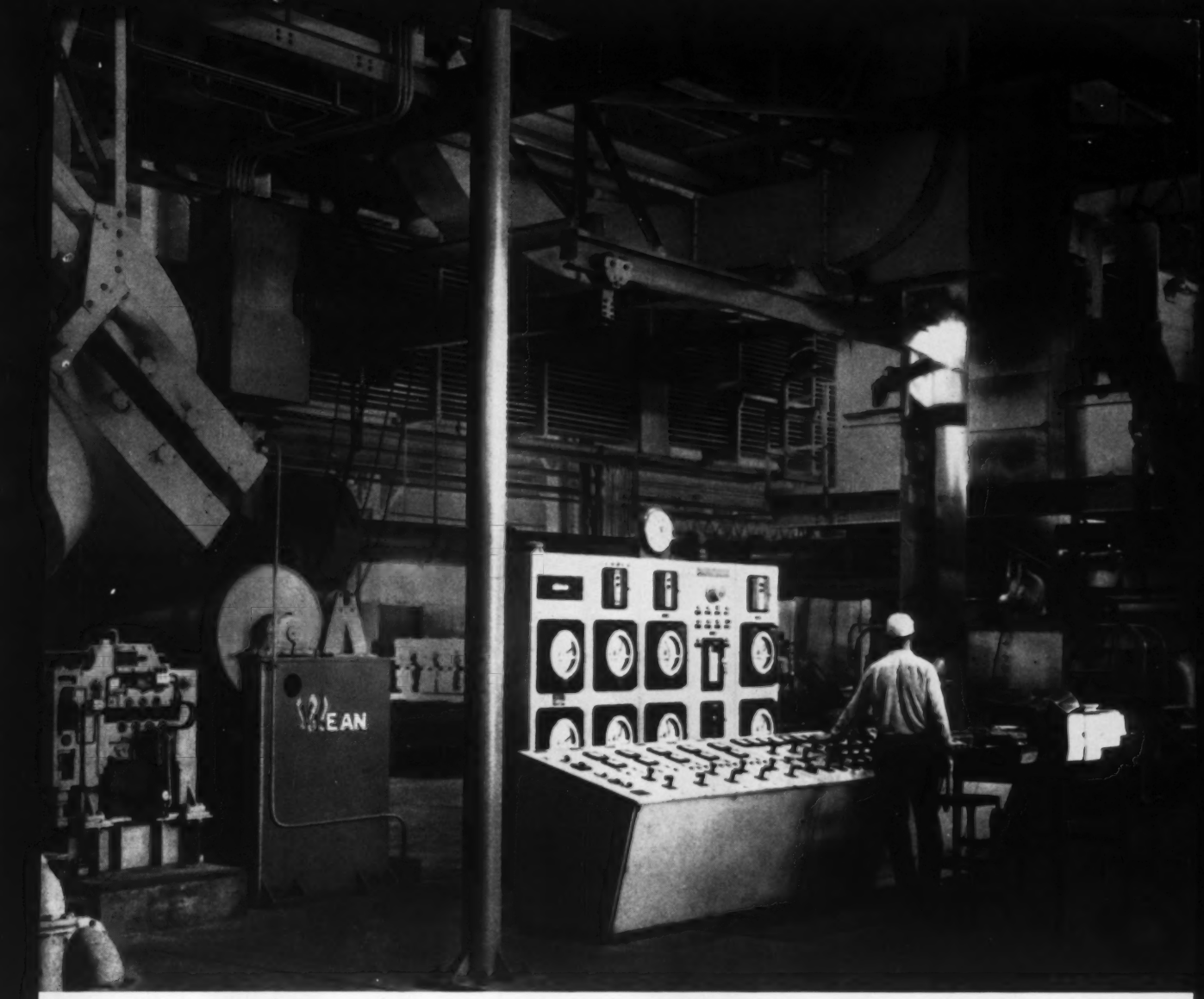

Reeves Steel gets top quality product, record output from Wean Galvanizing Line

The quality reputation of Reeves TiteKote® galvanized steel—and Reeves finished galvanized products—is well established. Produced by the Reeves Steel and Manufacturing Division of Empire-Reeves Steel Corporation on a 36" Wean line, TiteKote's excellent quality derives from both the outstanding operating practices of Reeves personnel and dependability of the equipment.

Installed at the Reeves Mill in Dover, Ohio in 1955, the Wean line has given trouble-free service since start-up. The Wheeling-type line handles gauges from 16 to 30, top speed on the lighter materials being 310 fpm. Strip from 18" to 36" wide in coils up to 26,000 lbs. is fed to the line after annealing and a temper pass on a two-high mill.

Wean's experience in continuous processing line design and construction has been built over 31 years service to the steel industry. Wean's "creative engineering" can make a major contribution to expansion or modernization of your finishing facilities.

WEAN

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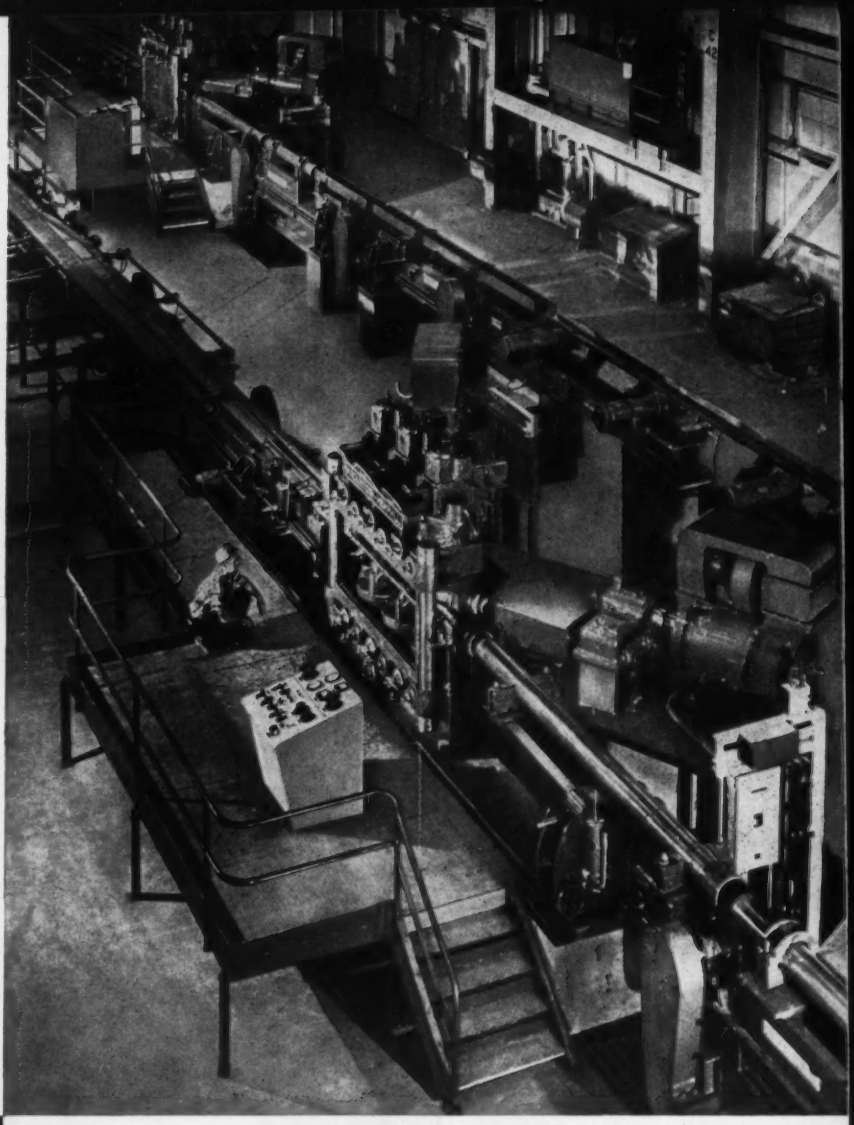
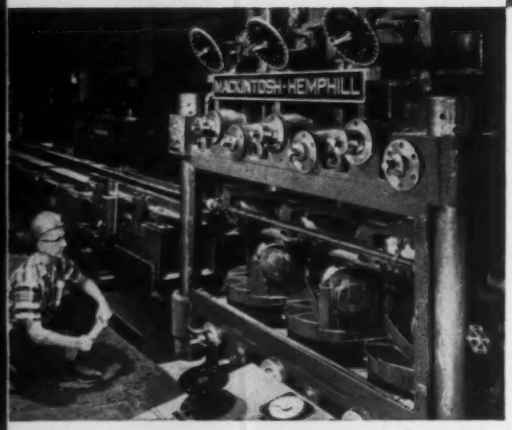
Why Mack-Hemp straighteners were selected for the world's most modern continuous weld pipe mill





The new continuous pipe mill at Lorain Works of U.S. Steel's National Tube Division is probably the most productive facility of its kind in the world, exceeding the record-breaking pipe mill at Fairless Works.

With straightness and roundness of delivered pipe more critical than ever, the Lorain Works assigns this important finishing task to two Mackintosh-Hemphill 6-roll guideless rotary straighteners. The two can process 1800 feet of pipe per minute. Finished pipe is perfectly straight and round, without spiral markings. "End hooks" at back and front are completely removed. Moreover, the straighteners' open three-post construction makes the rolls readily accessible, so that set-up time is cut to a minimum.

If you're concerned with straightening pipe or tube—no matter what the diameter or wall thickness—it will pay you to talk to Mack-Hemp. We have helpful information for you.

MACKINTOSH-HEMPHILL DIVISION PITTSBURGH U.S.A.
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MACKINTOSH-HEMPHILL
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